# New Zealand JOURNAL OF AGRICULTURE

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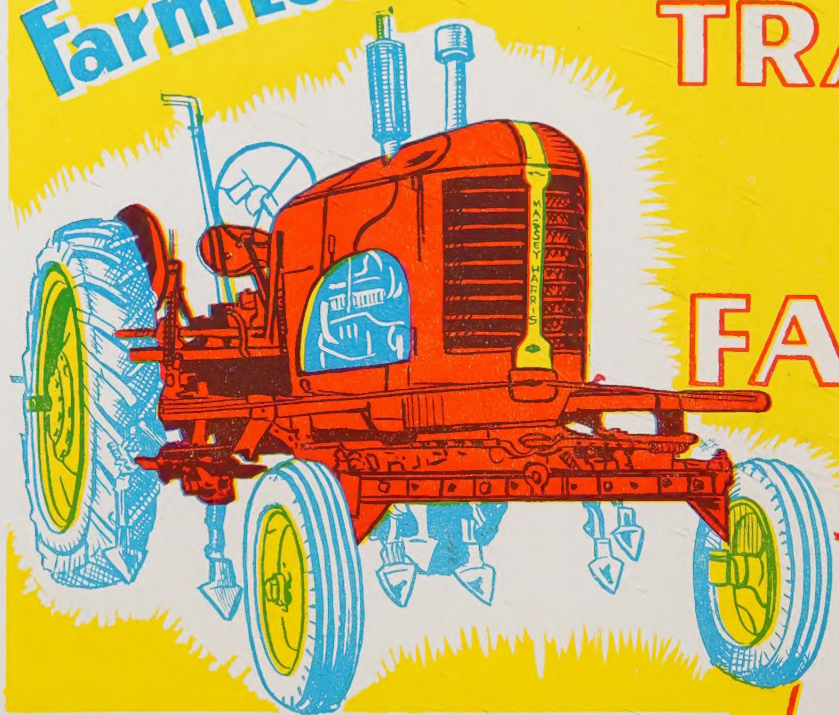

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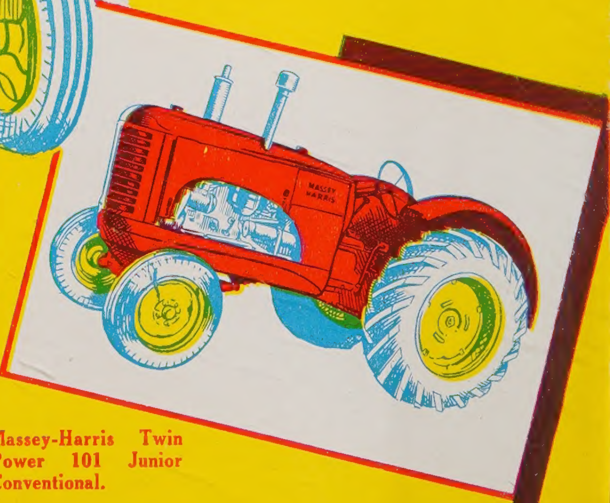

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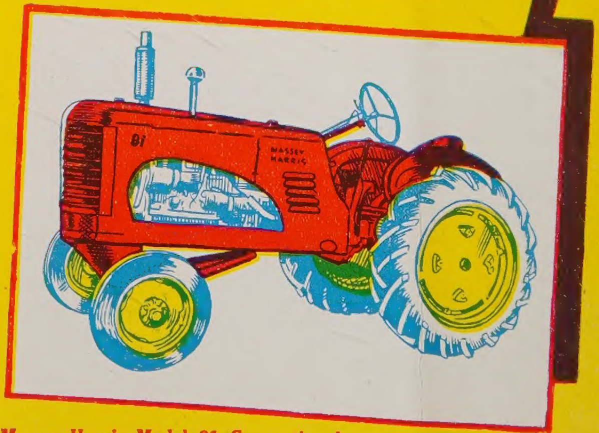

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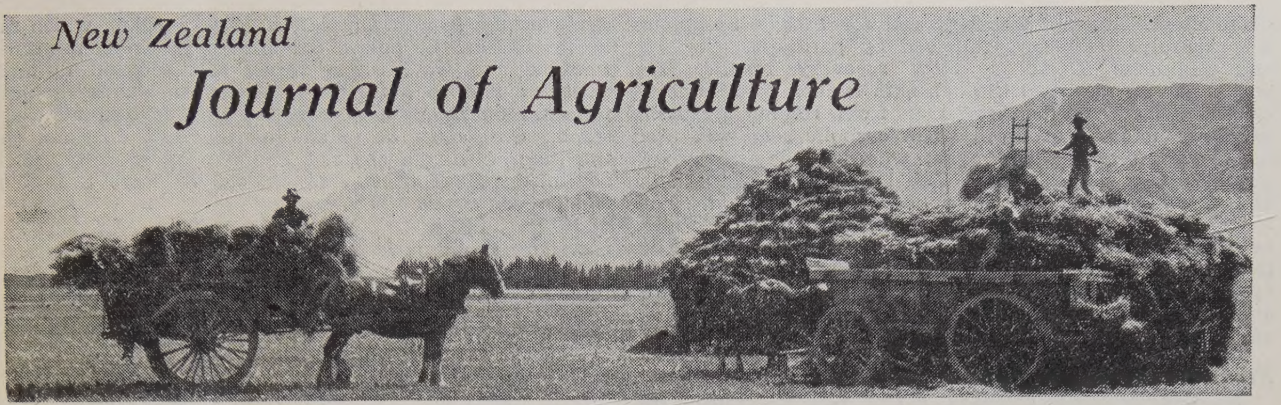

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# Mineral Poisons Affecting Stock

**INSTANCES of stock losses through poisoning by arsenic, lead, zinc, and other substances widely used in farming are reported from time to time. Causes and prevention of such poisoning have been previously dealt with, but in the following article, D. H. Le Souef, Veterinarian, Wellington, lays special emphasis on the dangers to stock through careless handling of common farm poisons.**

THE following is as general a treatment as possible of the manner in which stock may gain access to poisons, the symptoms which follow, and the common antidotes and general preventive measures necessary to avoid a recurrence.

## Lead

The poisonous forms of lead are litharge, red lead (used in paint and for plumbing), white lead (the common pigment, also used in the manufacture of linoleum and oilcloth), lead arsenate (for spraying fruit trees), and the common metallic lead.

Most common source of lead poison is paint. Victims are usually cattle which have an apparent liking for the sweet taste and several cases of poisoning in this way have been reported.

Another known case is where two cows died suddenly with acute symptoms arising from arsenate of lead spray.

The acute symptoms are colic, convulsions, coma, blindness, coldness of extremities, and passing of hard black faeces. Symptoms may appear after the first day and up to a week from the time of taking the poison.

Horses are less susceptible than cattle, pigs, or sheep. Birds, however, are most susceptible to this poison and care must be taken when painting a fowl run or, more particularly, a cage for members of the parrot family which cling to the wire. Treatment, which is likely to be successful if started in good time, consists of a drench of Epsom salts (6oz. to cattle) followed by raw milk and tea or coffee, brewed strong and allowed to cool.

## Arsenic

Arsenic occurs in a poisonous or toxic form in weed killers, wheat dressings, and sheep dip. As an oxide (white arsenic) it is almost insoluble and not dangerous, but the alkaline salts of sodium and potassium are readily soluble. These salts which are mixed with sulphur, soap, and so on to form sheep dip contain about 20 per cent. of soluble arsenic, and 3 per cent. insoluble arsenious sulphide for protection between dippings.

Most danger comes from dips. Dipping rams while hot after droving and allowing stock to graze over pasture contaminated by the overflow from dip and draining pens are known to have been factors contributing to arsenic poisoning.

**When poisoning occurs, symptoms of acute gastritis with colic, thirst and great weakness, staggering, straining, and so on are quickly apparent. Death usually occurs within a day or two, but stock sometimes die so quickly that symptoms are not noticed.**

**Cattle and dogs should not be dipped or sprayed in a dip prepared for sheep as the poison may be taken by the mouth or through broken skin.**

Directions for mixing dip should be followed carefully. When practicable, administer emetics and purgatives, then, with small animals, milk or egg white. Antidotes are calcined magnesia or ferric hydroxide, but oil with limewater and linseed tea, which are more likely to be readily available, are effective. The dip, of course, should be washed off the skin.

## Zinc

Zinc has caused losses mainly of pigs. Main source of the poison is new galvanised piping from which the lining has been dissolved by the acids of stale milk. The zinc passes into the milk in a soluble form. Pigs have been affected on several farms, the symptoms being swelling and tenderness of the joints, with consequent lameness, loss of condition and death. The antidote for zinc poisoning is carbonate or bicarbonate of soda with demulcents such as raw milk or white of egg. Usually, however, the symptoms are noticed after the trouble has gone too far for effective treatment. Prevention should be the aim. The pipes should be washed out with water. The water must be discarded before pumping the milk through to the pig troughs or holding barrel. These precautions are necessary only while the pipes are new. Once the surface has corroded the danger is past.

## Carbolic Acid

Carbolic acid, a coal tar derivative, has frequently caused coal poisoning, mainly in small animals. Dogs and cats are highly susceptible to this drug in its various compounds—creosote, phenol, and so on—which are used as disinfectants in skin dressings and for baths. Symptoms are muscular twitchings followed by paralysis, vomiting, and weakness. Death or slow recovery results. The poison can be absorbed through skin broken by scratching or biting, as with dogs suffering from eczema. Trouble is known to have occurred when carbolic soap was used in giving an enema and again when a disinfectant was put in a bath to kill fleas. The lethal dose through the alimentary tract is 1oz. for a horse and 1 to 2 drachms for a dog. The amount absorbed through the skin cannot be measured. Flesh after death by poisoning will give the characteristic smell. The antidote is Glauber salts (sodium sulphate) administered in solution by the mouth, and, of course, any carbolic on the skin should be washed off with plenty of water.

### *Strychnine*

Strychnine, as a common rabbit poison, is used by many stock owners. Care should be exercised in handling this poison because of the rapid and serious effect it has on farm animals and, indeed, on the careless rabbiter who does not wash his hands before handling food.

**At least one farmer is said to have reported his kill after a rabbit drive as "two hundred rabbits, two dogs, and three pigs"! He had neglected to tie his dogs up until all the rabbits had been collected. He had mixed up the strychnine in a shearing shed, also, and the pigs had had access to the shed.**

Strychnine is present in the seeds of plants such as nux vomica and is used as a tonic and stimulant in medicine. Used for rabbiting, however, it is a white crystalline powder, coloured pink artificially for safety, and in this form is a much more powerful poison.

Symptoms are shown in a powerful stimulus to the nervous system, especially the spinal cord, and tetanic spasms, with curvature of the back, tenseness and quivering of the muscles, are evident. Respiration is arrested and death occurs from asphyxiation. The antidote which must be printed on the poison container is a strong mixture of mustard and water or a strong salt solution to induce vomiting and so get rid of the poison. This should be followed by strong tea or coffee brewed and allowed to stand. Care must be taken that the fluid does not enter the lungs during a spasm. The remedy must be quickly administered. Tobacco and chlorodyne have been found effective as cures.

### *Caustic Soda*

Caustic soda has been known to cause poisoning of pigs and calves. Used in and about cow sheds for cleaning machines and so on it is liable to get into utensils for feeding milk. It is a strong alkali and has a corrosive action, burning the tissues of the mouth and stomach. The antidote is a weak acid solution such as vinegar or lemon which should be given at once, although after burning has occurred healing will be slow.

### *Common Salt*

Poisoning by sodium chloride or common salt has been reported among cattle, sheep, pigs, dogs, and poultry, the symptoms varying in the different species, but showing mostly in intense pain, dullness, diarrhoea, vomiting, collapse, and death. Sometimes the salt has been fed by mistake or has been added to food for medicinal purposes in excess of a safe amount. Trouble has occurred through rock salt becoming dissolved in rain water caught in troughs, and the strong solution drunk by stock (see this Journal, November, 1939, and January, 1942). Water or food containing 1.5 per cent. and upwards of sodium chloride have caused symptoms in stock and poultry, and should be regarded as dangerous. Treatment consists of giving emetics such as mustard and water, followed by stimulants such as strong tea and demulcents such as milk and white of egg.

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# Grecian Thistle in North Canterbury

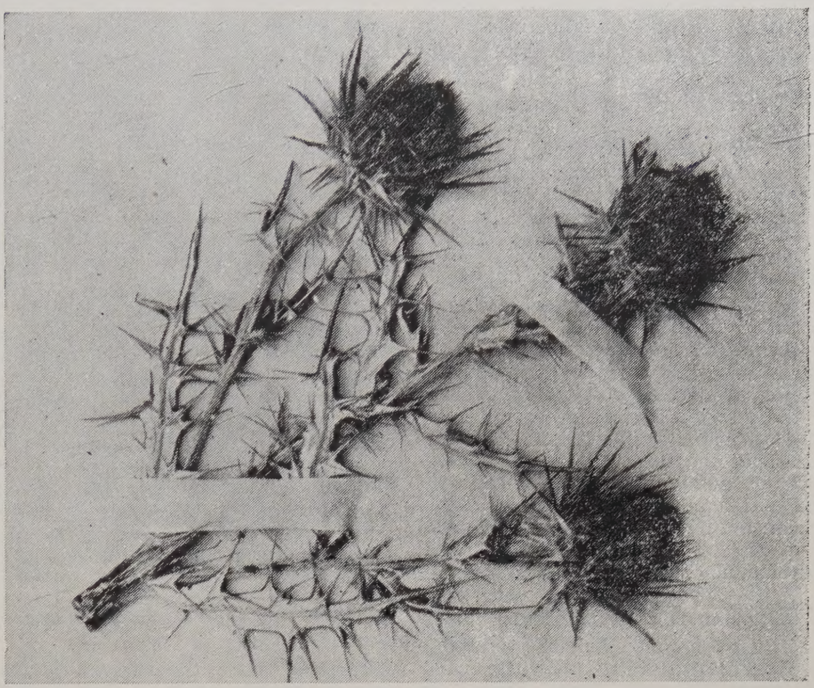
**GRECIAN thistle, a recent addition to the weeds of New Zealand, seems, from local reports, to have been established in parts of North Canterbury for at least 20 years. This article by A. J. Healy, Botany Division, Plant Research Bureau, Department of Scientific and Industrial Research, records the writer's botanical observations on the plant and discusses aspects of habitat, dispersal, control, and economic importance that are of interest to the man on the land.**

GRECIAN thistle, a recent addition to the weed flora of New Zealand, is a native of Asia Minor and Greece, belonging to a genus which is distributed in the Mediterranean region. The genus *Chamaepeuce* is closely related to *Cirsium*, which includes the Scotch thistle (*Cirsium lanceolatum*), and *Carduus*, which includes the winged thistle (*Carduus tenuiflorus*), all species widely dispersed in New Zealand.

## First Appearance

The Grecian thistle was first recorded for New Zealand by Dr. Allan in 1940 (A Handbook of the Naturalised Flora of New Zealand, Department of Scientific and Industrial Research Bull. 83), from Amberley, North Canterbury. His observations were based on specimens collected by M. Skinner (then Inspector of Stock, Amberley) in 1936. The writer's observations indicate that the thistle has been established in North Canterbury for some years prior to 1936, as it was found to be well established in several localities. Residents of the Omihi district state that it was originally observed some 20 years earlier along the Home Creek, a tributary of the Omihi Creek, and subsequent to this it appeared in other localities, where the plant is well known to settlers.

It has been confused with other thistles, and in North Canterbury passes under the vernacular names of "star thistle," "variegated thistle," and "winged thistle," all of which occur there. As the popular name for this plant in New Zealand the writer suggests Grecian thistle, incorporating the country of origin and avoiding confusion with other thistles already in New Zealand.



Terminal portion of stem of Grecian thistle showing flower heads.

## Description of Plant

The plant is a biennial, producing in the first season a rosette of leaves and in the second season a flowering stem up to 6ft. tall.

**Root system:** a tap root.

**Leaves:** lanceolate, 6 to 8in. long, pinnatifid, with each lobe bearing a pungent spine at its extremity, upper surface dull green to whitish (with cobwebby hairs, and white band along midrib, hence name "variegated thistle"); lower surface whitish with appressed cobwebby hairs.

**Stems:** up to 6ft. tall, on upper plant bearing the heads in more or less corymbose arrangement.

**Heads:** up to 1½in. diameter, with several rows of spine-tipped bracts, mostly with cobwebby hairs: lowest row of bracts recurved during late flowering or seeding period, and sometimes purplish in colour.

**Flowers:** to 1½in. long, purplish.

**Fruits** ("seed"): brownish, surmounted by pappus of feathery hairs.

## Distribution in N.Z.

The species is restricted to the Waipara and Amberley localities in North Canterbury, and the actual occurrences are given in the accompanying map.

## Habitat

Grecian thistle forms distinct communities several acres in extent on rocky areas in modified tussock grassland, as in Mt. Cass and Deans Peaks regions, and on loose rubble and waste land along the Waipara River and Weka and Omihi Creeks. The main infestations occurred at altitudes between 1,000 and 2,000ft., in modified tussock grassland, and were noted on ridge tops and both sunny and shady faces. The writer was unable to find any occurrences on good fertile soil on the flats; all occurrences on the flats were either on unconsolidated river-beds or on the stony shallow soils of the lower river terraces. From the behaviour of the plant in North Canterbury it is possible that it would succeed in the drier districts of New Zealand at least, and certainly up to altitudes of 2,000ft.

## Fruit ("Seed") Dispersal

Observations indicate that fruits have been carried down by the rivers and creeks along which the plant occurs, giving rise to the infestations along the lower reaches of these waterways.

Animal dispersal has been operative also; the illustration of the heads and the description indicate that "seeds" are well suited to stock dispersal. In the Mt. Cass locality plants were noted along the mustering tracks from the old-established blocks of thistle down to the shearing shed.

The wind would probably disperse the fruits in the neighbourhood of individual plants and large blocks, but no observations have been made of the extent of this method.

## *Economic Significance*

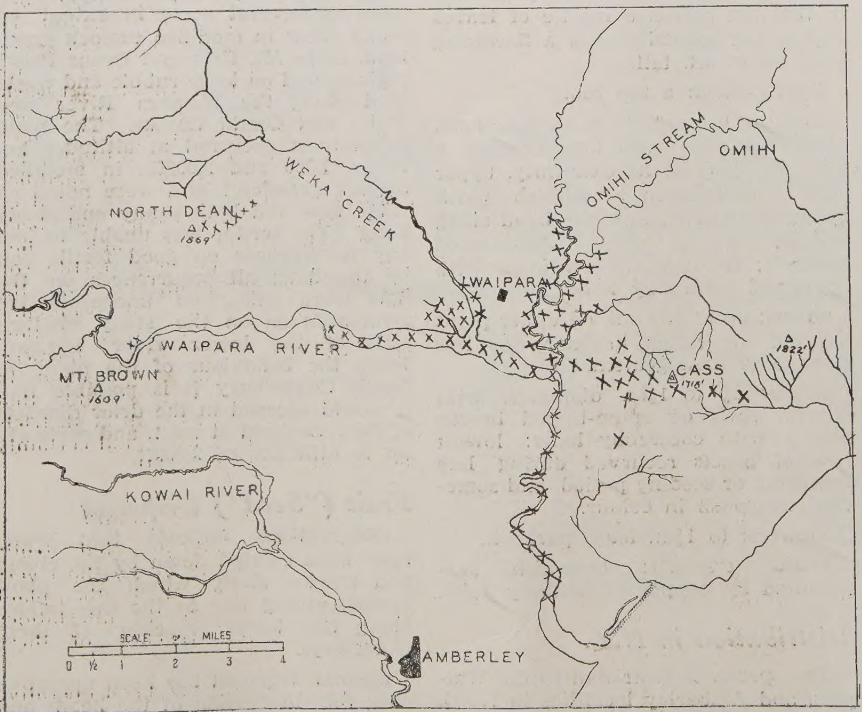
The writer's observations agree with the information gathered in North Canterbury that Grecian thistle has been present in the region for at least 20 years, and that the spread has not been excessive. It is probable that it will become more common on the river-beds and in the tussock grassland, but whether it would establish and spread on arable country cannot be foretold. The occurrence of the plant in rocky and sandy areas is a probable explanation why the plant has not been considered of any great economic importance. The foliage and heads probably cause inconvenience in handling sheep and wool from blocks where the thistle is well established.

Basal rosette of the Grecian thistle.

## *Control and Eradication*

Little data on control are available in North Canterbury, as little work has been done on these lines. On several properties patches of the thistle have been grubbed out periodically, but in the main no action has been taken. On some tussock blocks the patches are burned off incidentally when the tussock is fired, but the thistle returns. One property owner considers that this firing has caused a marked reduction in the size of the once large patches, but others have not observed any change in the infestations.

It is suggested that individual plants and patches of thistle which occur on dry river terraces and along river-beds could be grubbed or even scythed to prevent ripening of seed and spread to areas lower down the rivers. Any treatment for the blocks of thistle established in modified tussock grassland is difficult, due to poor access, presence of rocks, and other difficulties of terrain. Since there is no apparent direct loss occasioned by the existence of patches of several acres of the thistle, it would not be easy to reconcile expenditure of labour and money for eradication. Possibly grubbing of scattered plants, as is done with nasella tussock, could be carried out. Should the plant appear on the better-class country, control measures as adopted for other biennial thistles should prove successful.



Waipara locality, North Canterbury. XX denotes occurrence of Grecian thistle *(Chamaepeuce afra (Jacq.) D.C.)* to December 1, 1944.

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# ERECTING A SEVEN-WIRE FENCE

*By* **T. E. RODDA,** *Fields Instructor, Hamilton.*

**PROPER fencing is an art that can be learned and mastered only by actual practice at the work. The old saying, "Bad boundary fences make bad neighbours," is as true today as it was 60 to 70 years ago in this country. All types of fences are to be seen in this country, no two of them erected to the same pattern, and quite a number unsuited for the purpose for which they were erected; some are really first-class, substantially-built fences, which denote the handiwork of a master craftsman at his job.**

THIS article is written not for the farmer who has had a lifetime's experience at fencing, but for the beginner in the hope that the description and illustrations may prove of assistance and guidance to him.

## *Tools*

The first essential is a good kit of tools, which should consist of the following:—

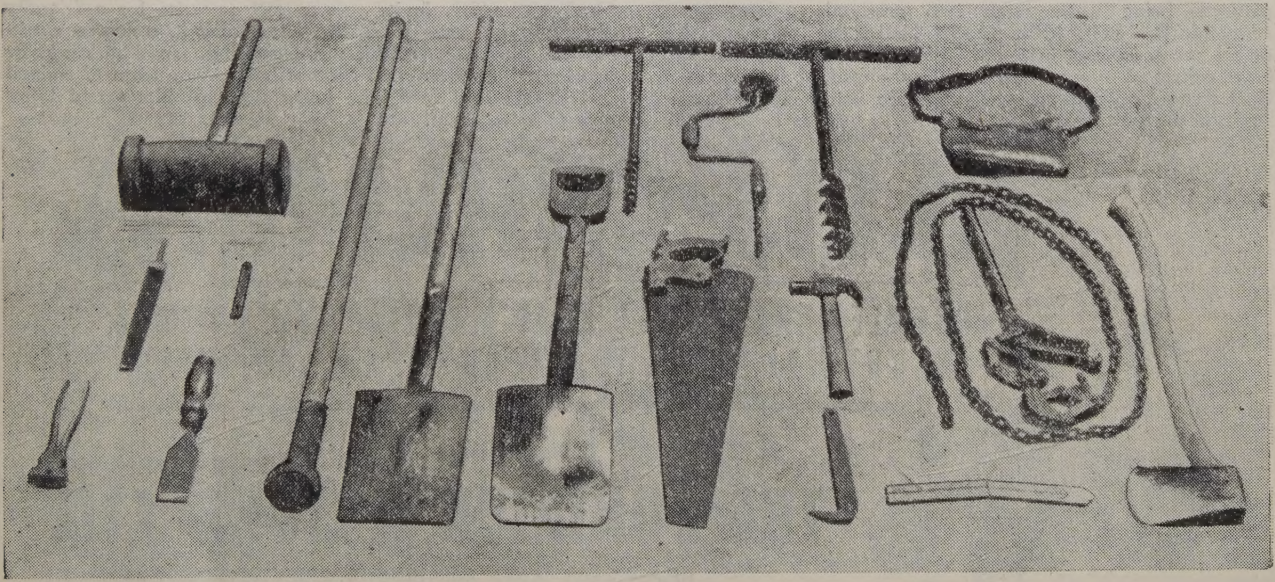
**Long-handled spade**
**Short-handled spade**
**Axe**
**Mall**
**1⅝in. auger**
**1½in. auger**
**1¼in. wood chisel**
**Claw hammer**
**Brace and bit**
**Hand-saw (crosscut)**
**Flat file**
**2ft. rule**
**Wire cutter**
**Staple puller**
**Wire strainer**
**Rammer**
**Posthole sinking bar**
**Bag for carrying staples and small tools**
**Wire twister**

All of the above tools, with the exception of the posthole sinking bar, are illustrated in the photograph below. Some fencers prefer to include a long-handled shovel and an adze.

Rammers are of several types. Most fencers prefer an all-wood rammer made from hardwood, such as jarrah, mairie, spotted gum, or ake ake. Others like a wooden rammer shod with a band of steel at the bottom, or a rammer made from an old buggy wheel axle-box fitted with a lightweight wooden handle (Fig. 1). The posthole sinking bar is usually made by welding a piece of good bar steel into the end of a 6ft. length of 1in. piping and flattening the steel out into the shape of a fish-tail. The handsaw should be a crosscut, preferably 6 points to the inch.

Another essential portion of the fencer's outfit is the spinning jenny or spindle for unwinding the plain wire, as illustrated in Fig. 2. The following are instructions for building: the bottom or base piece is formed of a piece of good 6in. x 4in. timber, 3ft. long, tapered at either end on the upper side. The bottom of the spindle is built with 2 pieces of 3in. x 2in. timber 4ft. long, checked in where they cross and slightly tapered at the ends to lessen the risk of being caught by projections when revolving. The top of the spindle is built of 3in. x 2in. timber, 2 pieces 1ft. long, checked in where they cross. Base piece, bottom of spindle, and top of spindle are bored to take a ¾in. pipe, which should be pointed at one end to enable it to be driven into the ground. The hole to take the pipe and allow for free working should be ⅞in. in diameter. An iron washer with a hole of sufficient diameter to take the pipe and a face diameter of 4in. and with 2 holes to take screws bored opposite each other should be fitted on the top of the base piece, also one on the under side of the bottom of the spindle. This will ensure smoother running and increase the useful life of the machine. The top and bottom of the spindle are joined together by 2in. x 2in. timber, 4 pieces 2ft. 6in. long, and placed as shown in Fig. 2 to accommodate the various diameters of the coils of wire.

Another method of making a plain wire unwinding frame (Fig. 3) is as follows:—Take two pieces of 3in. x 3in. timber 4ft. long and check in where they cross. In the centre bore a hole large enough to take a ¾in. bolt 9in. long, and in each arm bore two or three holes 1in. in diameter spaced to fit the inner diameters of the various coils of wire to be used. These holes should be bored with a slight lean towards the ends of the arms, so that the wooden pegs (15in. long) will have a slight lean outwards from the centre to prevent the wire from rising too high while unwinding. This cross is then mounted on a stub post 4ft. long placed 2ft. in the ground. A hole is bored down the centre of this post sufficiently deep to take 6in. of the 9in. bolt that will hold the cross in position, and on which it will pivot when the wire is being run out.



Kit of fencing tools.

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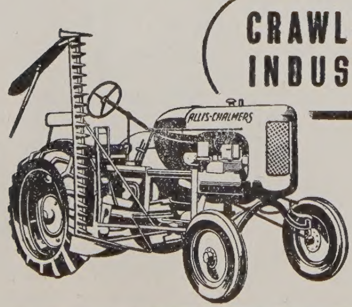

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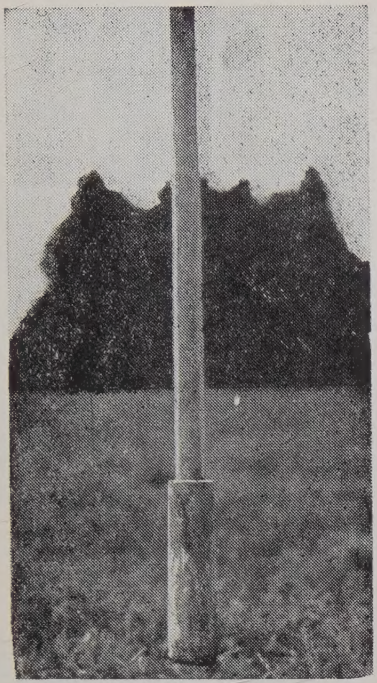


Fig. 1—Rammer made from an old buggy axle-box.

## Materials for Fencing

In the past our native forests have been able to supply all the timber required for posts and battens. Now that this supply of durable timber is becoming very scarce, posts will have to be split from varieties of trees grown in this country but indigenous to other lands. Unfortunately the timber produced by many of these trees is not very durable, and the varieties that do produce the more durable timber are hardly old enough yet. Good work has been done and is still being carried on by the State Forest Service in treating fencing timber with preserving agents to prevent decay, and it appears to be quite possible that in the near future many of our New Zealand-grown softwoods will be used for fencing.

**Concrete posts are now being used very extensively, and after the war, when steel for reinforcing becomes more plentiful, will be used in ever-increasing numbers. Concrete strainers have not been used so far to any great extent because the steel reinforcing has to be so strong. Their weight is also very much against them for transport over rough country. Many farmers have, however, adopted the method of building them in the positions they are to occupy. A hole is dug and boxing erected above ground, the reinforcing placed in position, and the concrete packed in the mould around it.**

Strainers and angle posts should be of good solid timber, of a measurement of not less than 8in. x 8in. at the top, and not less than 8ft. long for good holding country and up to 9ft. long for soft country. Stays should be 8ft. or 10ft. long, preferably 10ft. for long heavy strains. Shorter stays 6ft. 6in. or 7ft. long are suitable for short strains and level country, and they should be not less than 5in. x 4in. thick. Battens can be either sawn or split timber 2in. x 2in. or 3in. x 2in. thick and 3ft. 10in. long.

## Boundary Fence Specifications

The following are the specifications of one type of boundary fence generally erected between farms:—

> All strainers and ordinary posts and stays shall be of (here specify timber), and battens of (here specify timber). All strainers must be 8ft. in length and an average thickness of 8in. x 8in. Posts must be not less than 6ft. 6in. in length and stand up to a thickness measurement of 6in. x 4in. Stays must be 10ft. long and not less than 5in. x 4in. in thickness. Battens if sawn to be 2in. x 2in. and 3ft. 10in. long. If split to be not less than 2in. x 2in.
>
> All strainers and angle posts to be placed 4ft. in the ground and to be securely footed and stayed. The heads of the stays to be morticed into the strainers and placed inside the wire line and at a distance of 22in. from the top of the strainer to the centre of the mortice. Posts to be erected four to the chain and to be so placed in conformity with the ground as to keep the bottom wire as near as possible 5in. above the surface. All posts in dips and hollows to be securely footed and all posts and battens to be erected at right angles to the ground surface. Dip posts in soft boggy spots to be securely anchored by fastening two strands of No. 8 wire to the base of each post in firm ground on either side of the dip and running it over the head of the post in the centre of the hollow and twisting the wire on either side to ensure that there shall be no movement when wires are strained. Battens to be spaced so as to have 4 (four) between each two posts, and to be so placed that the tops are in line with the tops of the posts but swinging clear of the ground. All plain wire shall be No. 8 galvanised and barbed wire shall be No. 6 gauge with barbs 6in. apart. Wiring shall be as follows: the first 5 from the bottom shall be plain and the 2 top ones barbed. The top wire to be placed 2in. below the tops of the posts, and the spacings reading downwards shall be as follows: 9in., 8in., 7in., 6in., 5in., 4in., and allowing 5in. from the bottom wire to the ground.
>
> Ground on the upper side of the fence on very steep hillsides to be navvied or benched down to prevent cattle jumping over from the high side.
>
> No single strain shall be of a greater length than 12 chains.

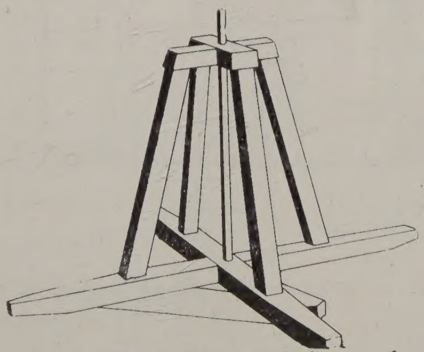


Fig. 2—Plain wire unwinding reel or spindle.

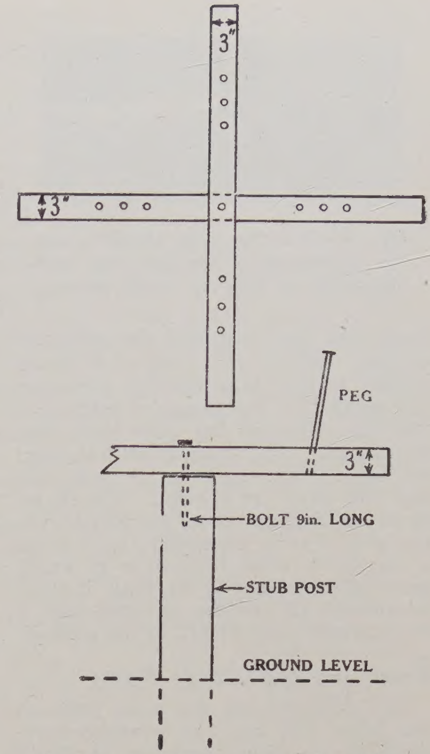


Fig. 3—Another method of making a plain wire unwinding reel or spindle.

Before the erection of a fence all material should be laid along the line as near as possible to the position in which the fence is to be built.

## Erection of Boundary Fence

If a boundary fence has to be erected along a surveyed line, the wire of the finished fence must be

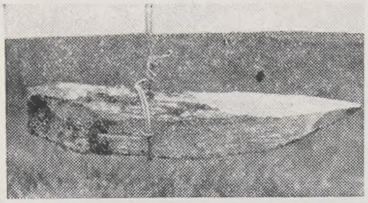


Fig. 4—Showing how block is cut for anchoring a strainer post and blocking at base to resist strain.

dead over the centres of the pegs, the centres being indicated by tacks driven in the tops by the surveyor. The method of erection is as follows:—The line between the pegs must first be flagged with straight sticks about 4ft. high. Next the holes must be dug and the strainers erected. The holes must be dug as close as possible to the peg if it is necessary, as it is in a corner, to erect a strainer or angle post. If a strainer is 8ft. long, it must be placed 4ft. in the ground, and a 9ft. strainer must be 5ft. in the ground.

### *Strainers and Angle Posts*

The strainers are the main posts in the fence, and all care must be exercised to see that they are carefully and solidly placed in position. In excavating the hole see that it is marked out and dug in line with the fence, with the filling side opposite to the strain of the wires and the solid face to the front. This solid face should be slightly off the perpendicular so that when the post is erected it has about ¾in. to 1in. of lean directly away from the line of pull. Dig square and straight down alongside the peg, but allow sufficient room on the side of the post opposite the survey peg to enable the rammer to be used freely. A space of 6in. or a little more should be allowed between the back of the post and the back wall of the hole to allow for a foot to be inserted. One corner on one side wall of the hole must be slightly undermined to receive one end of the foot, which can be made out of a solid piece of wood from 1ft. to 15in. long by 6in. by 6in.; one end should be slightly pointed by cutting off on the underside, keeping the top level. Double a piece of No. 8 plain wire into a strand 5ft. long, and wrap the doubled end around the centre of the foot and securely twist on top (see Figs. 4 and 5). Place a staple over the wire on the under side and one on either side of the foot. When the strainer is stood on end in the hole and a very slight amount of earth rammed in the bottom, lower the foot down the hole, pointed end downwards, aiming for the undermined side, and ram into position by hitting it with the rammer on the top side but at the end opposite to the point. When the foot is forced into position bring the double strand of wire up the back of the strainer to a point 3in. above ground level; pull tight and staple and then turn the loose end over downwards and staple below ground level. Ram the soil solidly into the hole, being most careful to ram well at the bottom. Also be careful to see that the edge of the strainer nearest to the survey peg is kept in true line with the line pegs or flags.

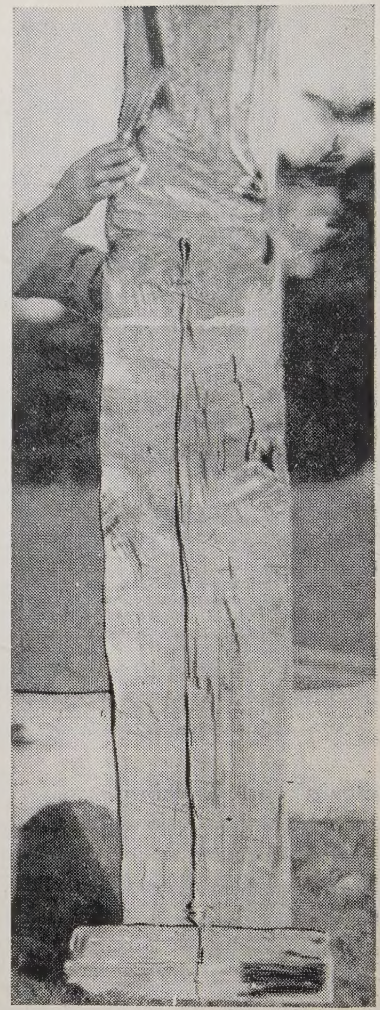
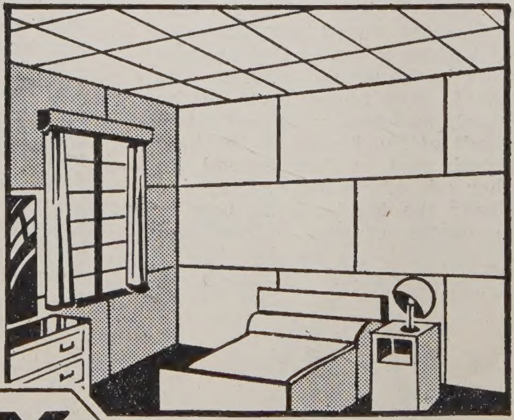


Fig. 5—Foot and strain resistance block as it is attached to the strainer.

### *Bracing and Staying Strainers*

The next step on hilly country is to place a breast block across the front of the strainer facing the strain. This block should be of good solid timber at least 6in. x 4in. and 4ft. long. Dig a trench not quite 4in. wide and about 8in. deep across the front of the strainer, place the block narrow edge down, and ram solidly into the trench until it is below ground level. A mortice to take the head of the stay is then cut with an auger and chisel, with its centre 22in. from the top of the post and its wire side just inside the line of wires when strained (see Fig. 6). The head of the stay should



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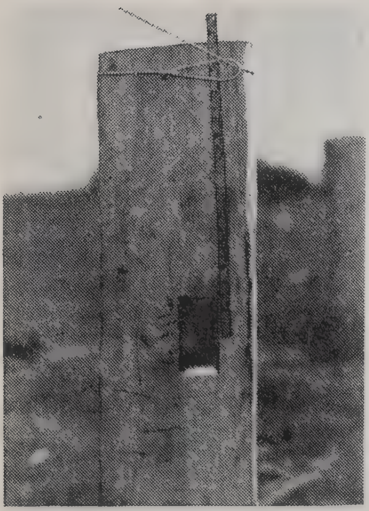

Fig. 6—Strainer post showing mortice cut for stay.

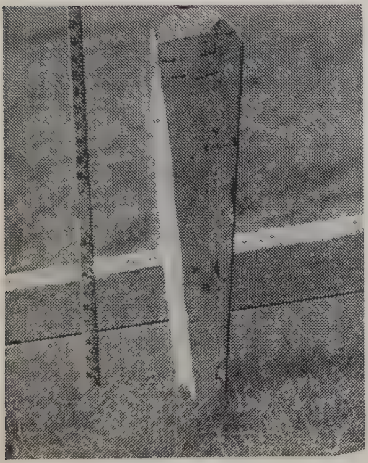

Fig. 8—The wedge for tightening and holding the stay.

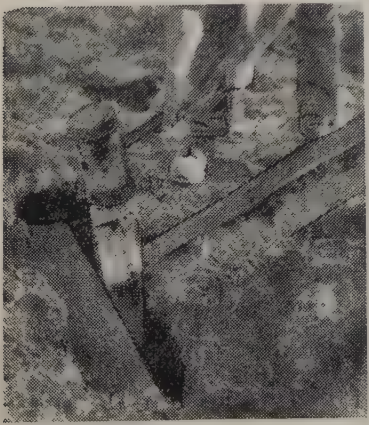

Fig. 9—Driving the wedge into position.

be trimmed with saw and axe to make a neat fit into the mortice as illustrated in Fig. 7. There are two methods of footing the stay. The first is by cutting a trench at the foot of the stay at right angles to the fence with a slight slope towards the strainer. In this trench, which should be about 9in. deep, place a block of good solid wood at least 6in. x 4in. and 3ft. to 3ft. 6in. long with the flat side up against the bank. Midway along the trench, fairly close to the wire, make a small sloping trench to enable the stay to reach the block. Prepare a wedge 2ft. long and 6in. thick at the top end as illustrated in Fig. 8., and drive lightly between the block and end of the stay (Fig. 9). Do not drive fully home until two plain wires have been strained—preferably the top one, which will be plain if the fence is according to specifications, or the second wire from the top if the top one is to be a barb, and the third or fourth wire from the top to act as guides when erecting the posts.

A second method is to use two blocks and two wedges at the foot of the stay as illustrated in Fig. 10. The first block is 4ft. long and the one at the foot of the stay is 2ft. 6in. long. The wedges are partially driven in, and later on driven into their permanent positions when two wires have been strained. If it is found that they cannot be fully driven home without forcing the strainer back over the limit allowed backwards against strain, the wedges can be sawn off flush with the tops of the blocks. Earth should be well rammed between the two blocks. This method is recommended for soft country.

If a strainer is in a right angle, two stays must be fitted as illustrated in Fig. 11, in which both stays are shown close to the wire. This is quite good practice on flat country, but on hilly country, where the wire pull on strainers is much greater, it is advisable to place one stay slightly in to the corner about 1ft. off the wire line. For long, heavy strains it is advisable to set the foot of one of the stays 18in. or 2ft. in from the wires towards the field being enclosed, with the mortice altered to suit the change in direction. Where a corner strainer is placed on the side of a hill and where both fences take off downhill the only safe way of anchoring is to dig a long narrow pit two or three yards up the hill at a point which, if sighted with the strainer, will divide the angle equally. This pit should be about 3ft. deep, according to the slope of the hill, and long enough to take a piece of good timber 4ft. long and up to 8in. in diameter. A very narrow cut should be made from the centre of the trench to the strainer to take 4 strands of No. 8 wire, which should be placed around the middle of the log and around the strainer 20in. from the top. After filling and ramming the earth into the trench the wires can be twisted up with a stick as shown in Fig. 12. This method of anchoring is known as the "deadman."

All angle posts where the wires pull around in straining should either be fitted with a stay or breastblock (Fig. 13).

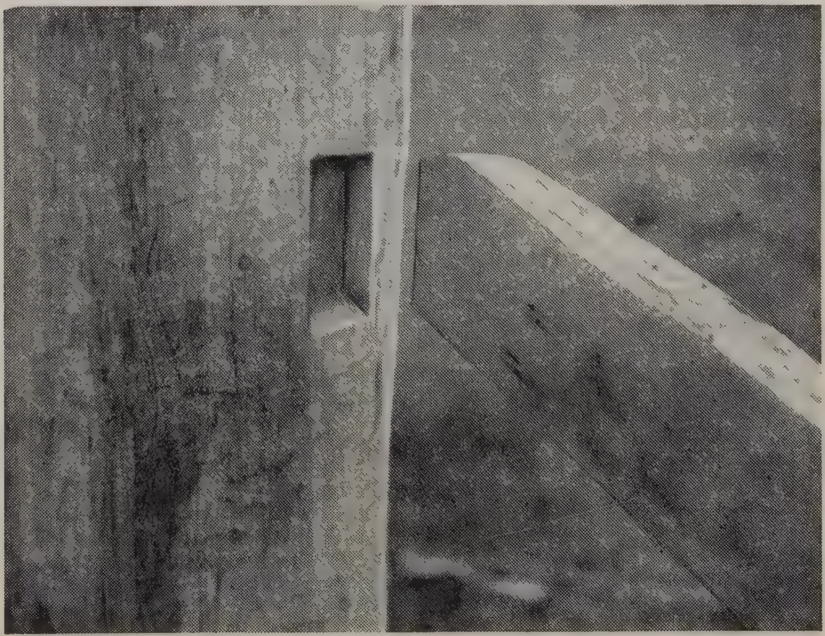

Fig. 7—The head of the stay trimmed ready to be fitted into the mortice.

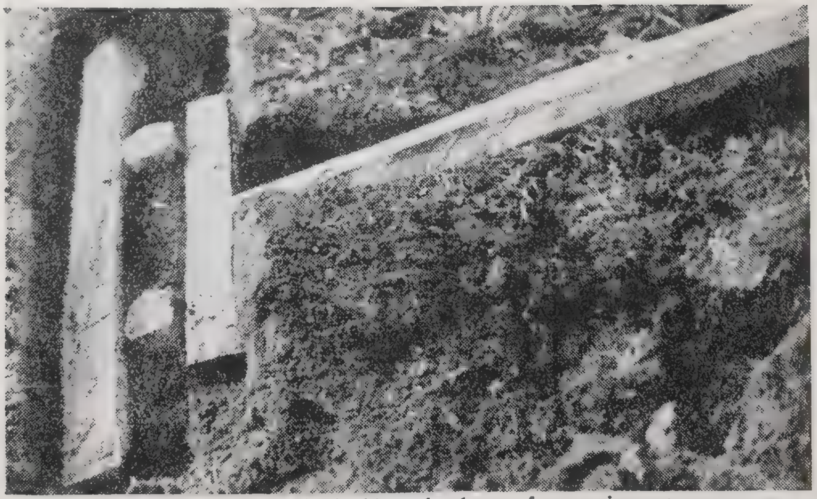

Fig. 10—Method of blocking the base of a strainer stay.

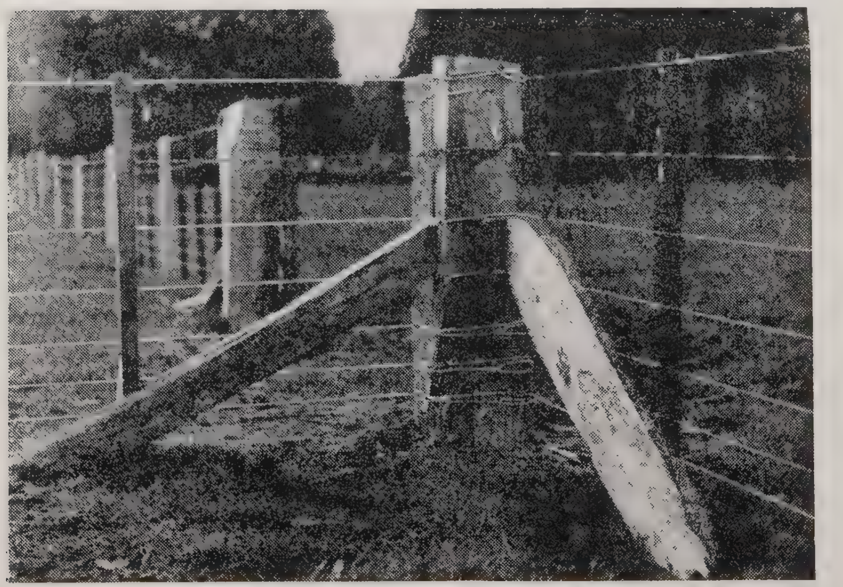

Fig. 11—Strainer post in position.

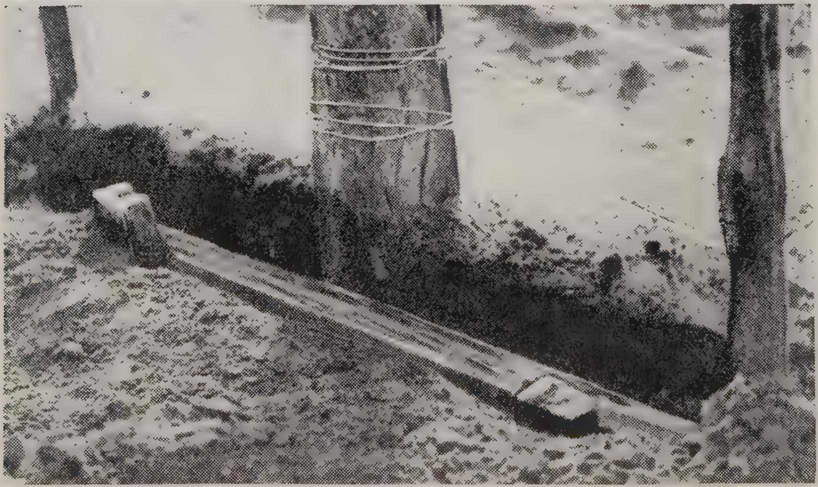

Fig. 13—Method of blocking an angle post. The same method is used for blocking the front of an ordinary strainer post.

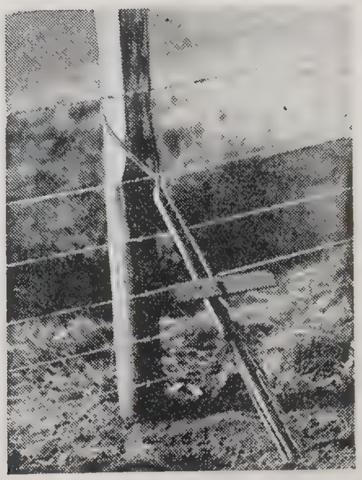

Fig. 12—Method of holding an angle post in position on an angle of a drain where it is not suitable to place a stay across the drain. The same method may be adopted for anchoring corner strainer posts on the side of a hill and where both fences take off downhill. For really heavy strains 4 strands of No. 8 wire are used in place of the 2 shown in this photo.

A strainer should never be placed in a hollow or bad depression if it can be avoided.

## *Erecting Posts*

Before beginning to erect posts make sure that the two guide wires are true and touching the pegs between strainer post and strainer post. Mark out the situations for each post so as to place them four to the chain. Erect a straight-faced post here and there along the length, keeping them in about ½in. off the wires. The wires can then be stapled to these posts and a staple hung over each driver staple at the back of the wire to keep the wire the correct distance from the posts. Starting from one end of the line, all the posts can now be erected keeping them about ½in. off the wires to prevent pressing the wires off the straight or true line. All posts should be of an average height of 4ft. from the general run of the ground. On more or less level land all posts should be erected perpendicular, but on hillsides and slopes they should be at right angles to the slope of the ground to ensure that the wires in all places run with the slope of the ground (Fig. 14). All posts should be well rammed right from the bottom of the hole. Many beginners who make a mistake in placing too much loose earth into the hole at first wonder why the post does not tighten satisfactorily. The only way to tighten a post properly is to place a little earth in first and thoroughly pack it with the rammer before placing any more in and so on until the hole is thoroughly packed right up to the top. Posts in slight depressions or dips should be footed in a similar manner to the strainers, and all posts in dips and soft boggy ground where footing would be ineffective should be tied down as described in the specifications and illustrated in Fig. 15.

In preparation for wiring the erected posts a gauge stick 4ft. 6in. long should be made from a light, tough piece of wood such as white pine, on which marks can be cut lightly with a saw. The first mark should be 6in. from the top end to represent the height of the post, the second 2in. below the first, and further marks made at spacings of 9in., 8in., 7in., 6in., 5in., 4in. All wire positions can then be marked on posts by using a 4in. nail.

A coil of plain wire is put on the spindle, which should be near a strainer post so that it will serve two lengths of strain. Take the loose end of the wire over one shoulder and walk to the next strainer post, where the wire is passed through a half driven-in staple indicating the position of the particular wire. The wire should be passed round the post and, after allowing 8in. to 1ft. over, bend it down over itself and staple the double strand into the post not less than 5in. from the edge. The loose end should then be bent back towards the wire face and tapped down to the wood, and the staple driven well home. The method of fastening is illustrated in Fig. 16.

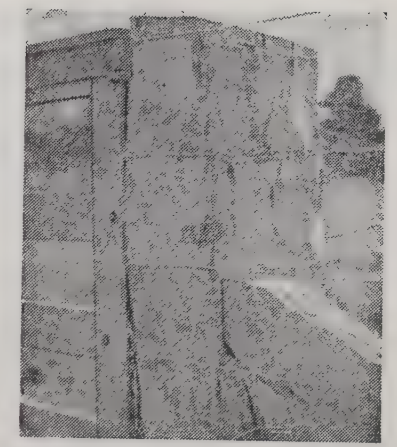

Fig. 16—Method of attaching wire to strainer.

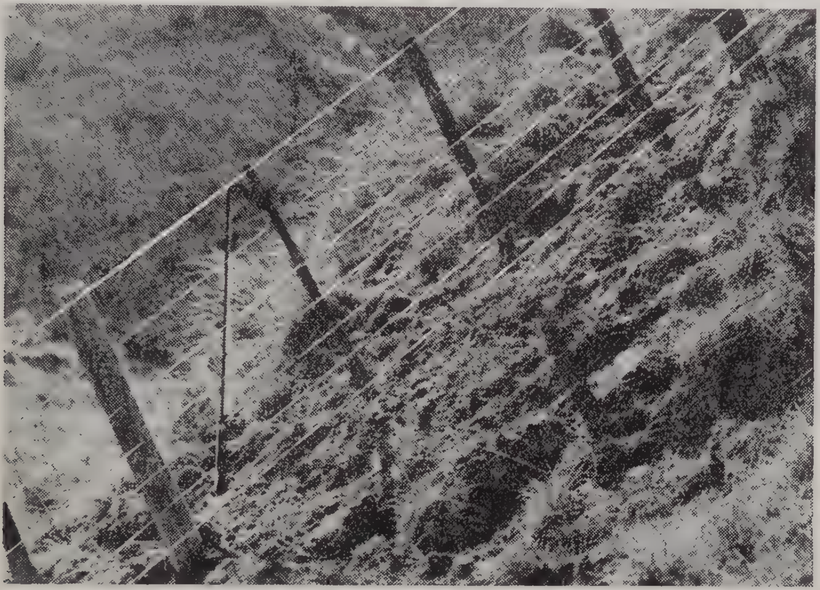

Fig. 14—How posts and battens should be placed on a steep hill face. The line of the string suspending the hammer shows the perpendicular.

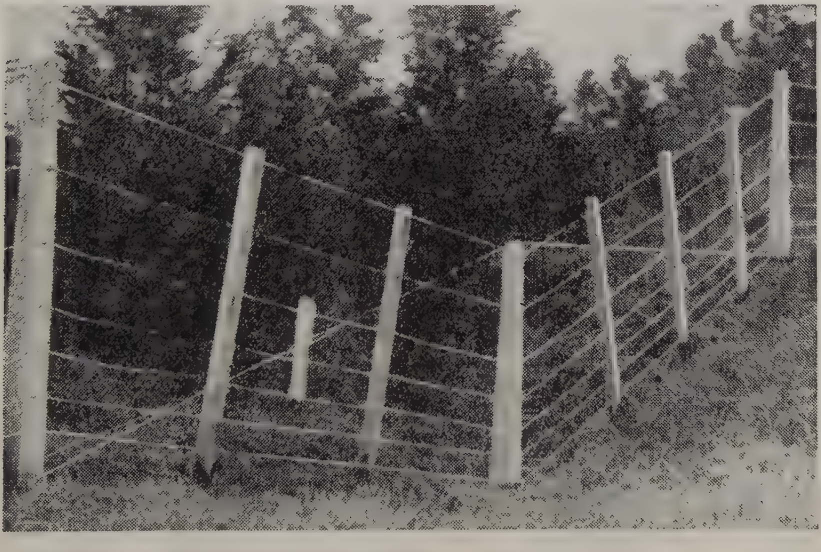

Fig. 15—Method of fastening down a post in low place where the land is wet. Two strands of No. 8 wire are fastened at ground level to each side post planted on solid land, and passed over the top of the post in the hollow, and tightened by twisting with the two pieces of wood.

## *Straining and Stapling Plain Wires*

The placing of one wire should be completed before going on to the next. Having two wires (the guides) already strained, begin with the bottom wire and follow on until all are in position.

In long strains it is preferable to strain in the centre, bedding the wires well into the wood of each strainer post by tapping in with the hammer, beginning at the staple and finishing at the loop. In short strains the tightening is done at a strainer post. As the wire is being placed around the post after being strained sufficiently, it is hammered well into the wood, beginning at the face side of the fence and following the wire around until it is bent over itself to form the loop. Before stapling and releasing the strainer on each plain wire it is advisable to pull the wire outwards from the fence somewhere about the centre of the strain to take the curl or twist out of it; the amount of slackness that will have to be taken up on returning to the wire strainer is surprising. All wires should be stapled in all hollows and steep rises and along level areas, but if stapling is left on small rises until the fastening or joining has been completed and the wire strainer released, any slackness that may have occurred during fastening or joining can be taken up.

Wires are more pliable and will strain better after the middle of the day than they will in the morning, particularly in cold weather.

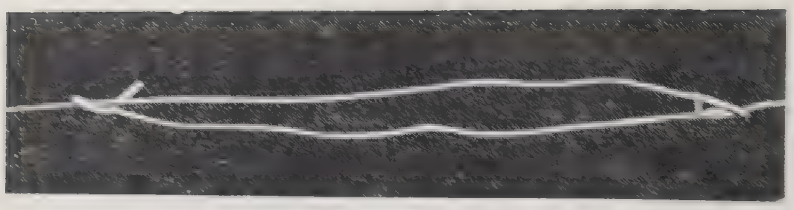

Fig. 17—Method of tying the figure 8 knot.

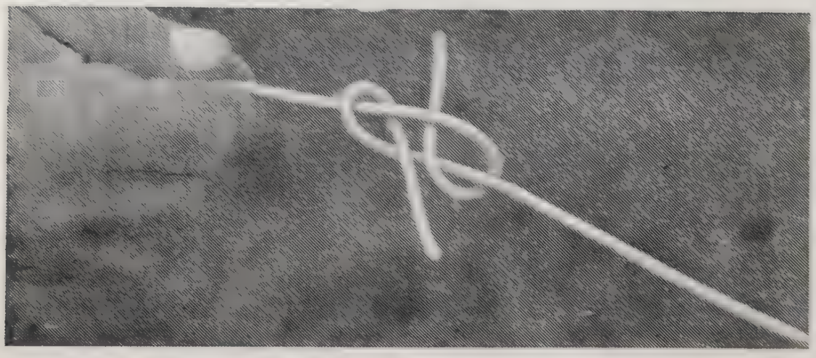

Fig. 18—The figure 8 wire knot tied but not strained. Note how the two ends of the wires must be in contact with each other when the knot is tied correctly.

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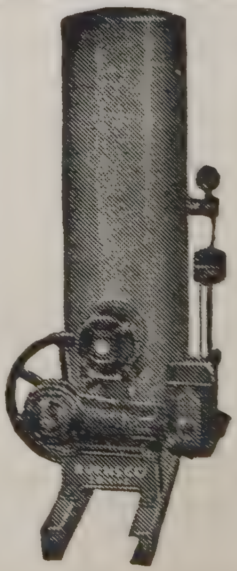

In hollows a staple should first be driven half home with both points on the mark and then bent slightly downward to hold the wire when pulled down, when another staple is driven in the usual way. The same method in reverse should be used on rises. Staples should be zig-zagged up the posts and should be slightly skewed to minimise splitting the timber, which will cause the staples to pull out.

## *Straining Barbed Wire*

A little more skill and judgment are needed for the proper straining and tightening of barbed wire than for the straining of plain wire. It is a good plan to place a few pieces of wood or old pieces of timber under the barbed wire on high points of the fence line to keep as many as possible of the barb points off the ground.

With short lengths of fence straining is better done at the post, but in long strains of 10 to 12 chains it should be done at the centre. When it is considered that nearly sufficient tension has been put on the wire should be tried by drawing down into hollows and pulling away from the fence, when the wire will stretch and give a little. If, after allowing for hollows and rises, the wire does not seem tight enough it should be strained a little more, and the strainer left attached in case further straining or slackening off has to be done. Stapling should be done first on all hollows, steep rises, and level portions of the line, leaving the slight rises until the wire has been joined up and the wire strainer released.

## *Putting on Battens*

Stapling battens to a fence is generally considered a job for two persons, but can be readily performed by a man working on his own. The tops should be kept level with the tops of the posts, but should swing free of the ground. Batten staples 1in. long should be used and should be placed with both points actually touching the wire and driven well home; they should be zig-zagged up the batten to minimise the splitting of the timber and the pulling out of the staples.

The useful life of battens can be lengthened if 3in. of both ends are dipped in boiling tar; the timber must be absolutely dry before this is done.

## *Wire Knots*

Practically all fencers agree that the figure 8 knot is the most satisfactory for either barbed or plain wires. To tie such a knot with barbed wire it is advisable to remove one barb from one end of each of the wires to be joined. The method of tying the figure 8 knot is illustrated and described in Figs. 17 and 18. If a wire breaks in any portion of the strain excepting near a strainer post,

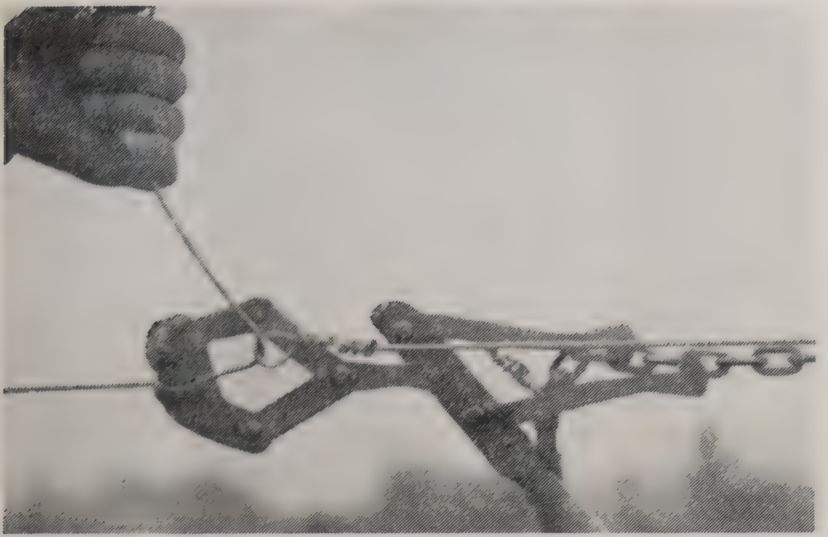

Fig. 19—Method of straining a wire in the centre of a length of fence, or a broken wire. First of all a loop is made in the right hand piece of wire as shown and the wire strainer grips applied to each piece of wire, allowing sufficient wire on the left hand piece to pass through the loop as shown.

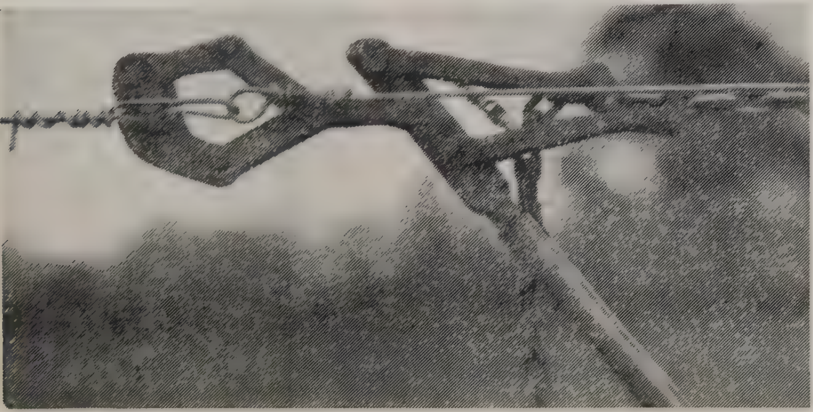

Fig. 20—When sufficient strain has been placed on the wire by operating the handle of the wire strainer, the wire through the loop is tapped up as tight as possible to the grip and twisted as shown to form the second loop.

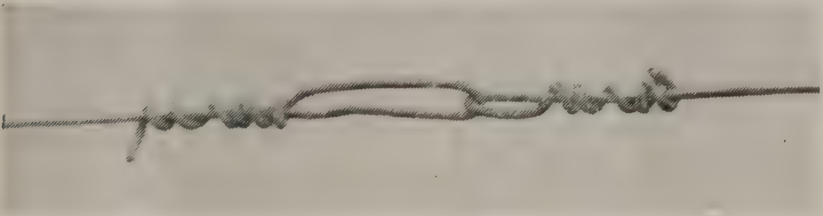

Fig. 21—The completed double loop splice.

the most satisfactory way of splicing is to use the double loop as follows: Take one end of the broken wire and on to it with a figure 8 knot join a piece of fresh wire; attach the wire strainer to the other end of the broken wire about 6in. from the end; attach the travelling grip of the strainer to the fresh piece of wire and work the handle until the wire is sufficiently strained; cut the fresh piece of wire off with sufficient spare wire to make a loop when turned back on itself and twist securely. The free end of wire close up to the stationary grip of the strainer is then passed through the loop and bent back on itself and hammered up to take up the slack and twisted around itself at the back of the grip. The tying of this double loop splice is illustrated and described in Figs. 19, 20, and 21.

## *Flood Gates*

Where a fence line crosses a creek or watercourse that is dry or semi-dry for most of the year, but may develop into a torrent during heavy rains, it may be necessary to erect a flood gate to prevent stock getting under. This is usually constructed by running two or three strands of No. 8 wire just about ground level and securely fastening each end to a substantial post on either side of the creek, but well enough away from the edges to ensure good holding. Twist the wire strands with a stick to ensure tightness. From split timber make a frame board large enough to reach from bank to bank and from wire level to just above creek bottom. With wire and staples fasten to this frame other pieces of split timber to form a barricade, which is suspended by hinges or loops made of 2 strands of No. 8 wire passed over the wire cable at normal ground level and fastened to the top rail. It will act as a stock block during dry periods, will open by swinging downstream during floods, and return to its normal position afterwards, provided no logs or boulders have lodged under it.

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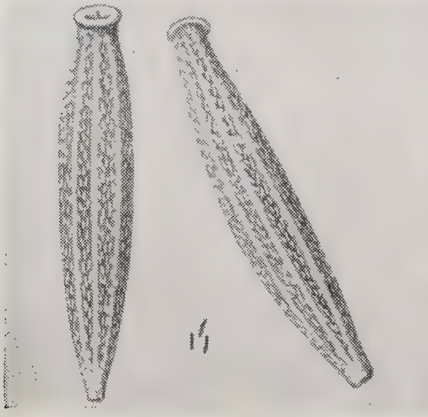
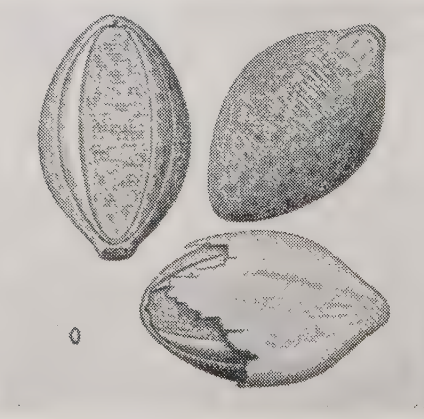
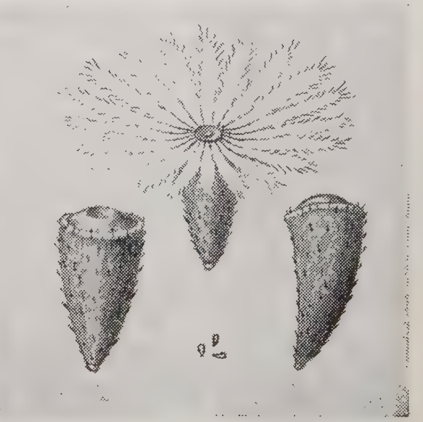


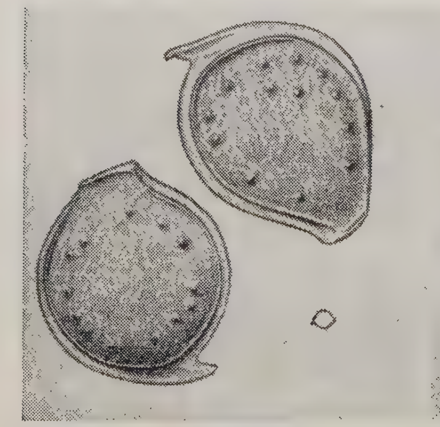
*SENECIO VULGARIS:* GROUNDSEL. Colour grey. Occurs with medium frequency in crested dogstail and yarrow, and occasionally in ryegrass and cocksfoot. Australia admits not more than 100 seeds to the ounce. An annual weed of cultivated land.



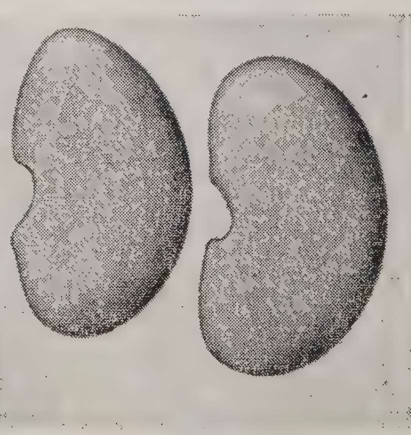
*SETARIA VIRIDIS:* GREEN PIGEON GRASS: BOTTLE GRASS. Colour yellow to light brown, usually with dark blotches. Occurs with medium frequency in alsike, less commonly in red clover and lucerne. Australia admits not more than 400 seeds per ounce. An annual weed of little importance.



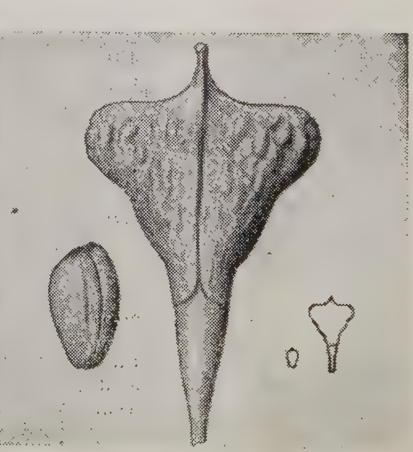
*GALINSOGA PARVIFLORA:* YELLOW WEED. Colour black with white pappus. Occurs rather infrequently in seed imported from America. Australia admits not more than 50 seeds per ounce. An annual weed of cultivated land. It has become established in several places in New Zealand.



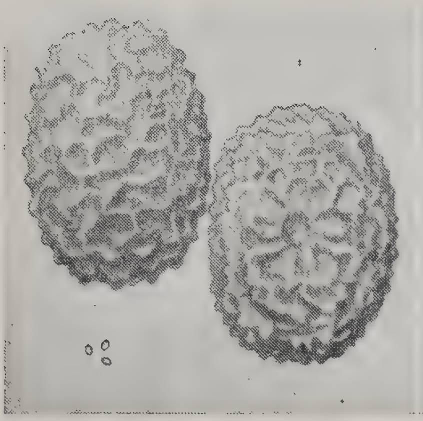
*RANUNCULUS SARDOUS:* HAIRY BUTTERCUP, HAIRY CROWFOOT. Colour brown. Occurs with medium frequency in ryegrass. Australia admits not more than 20 seeds per ounce of *Ranunculus* spp. An annual weed of wet pastures.



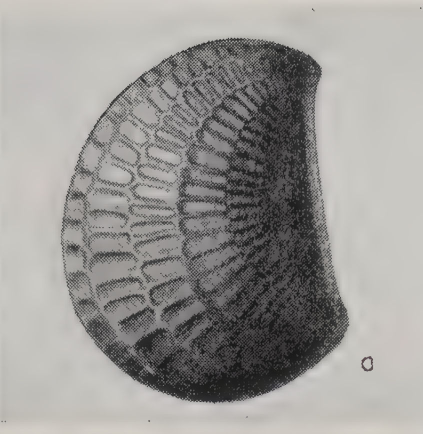
*MEDICAGO HISPIDA:* BURR-CLOVER. Colour yellow to brown. Occurs with medium frequency in ryegrass and red clover. An annual weed often abundant in dry pastures. The spiney, burr-like pods become entangled in wool and may impair its value.



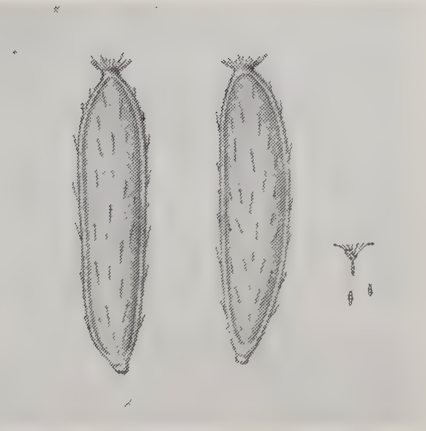
*MYAGRUM PERFOLIATUM:* MYAGRUM. Pods straw coloured, seeds brown. Occurs infrequently in imported grain. Australia prohibits importation. An annual weed which has not become established in New Zealand.



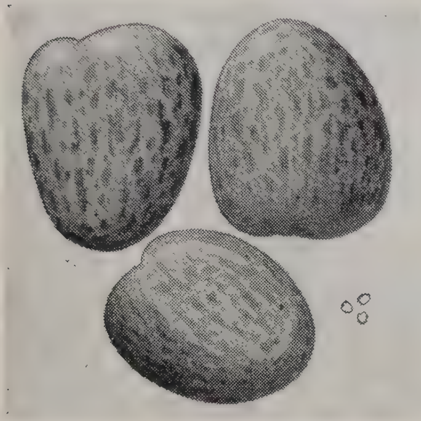
*LINARIA ELATINE (Kickxia elatine):* POINTED-LEAVED TOAD-FLAX. Colour brown. Occurs rarely in *Lotus* spp. and white clover. Australia admits not more than 100 seeds to the ounce. An annual weed of little importance.



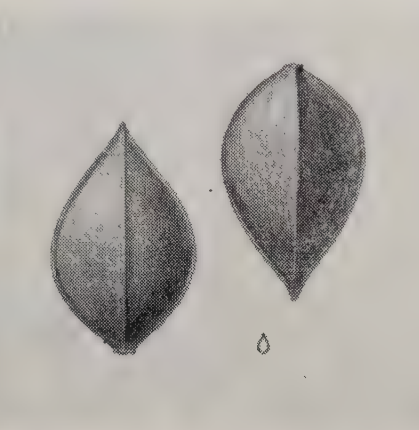
*GLAUCIUM FLAVUM:* HORNED POPPY. Colour black. Occurs rarely in lucerne and red clover seed, and in cereals. An annual weed most commonly found near the coast.



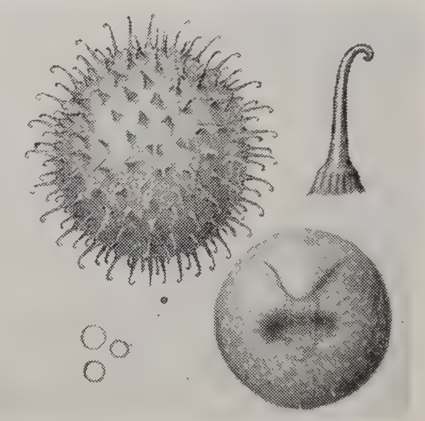
*ERIGERON CANADENSIS:* CANADIAN FLEABANE. Straw coloured. Occurs infrequently in cocksfoot, yarrow, and browntop. Australia admits not more than 100 seeds per ounce. An annual weed of little importance.



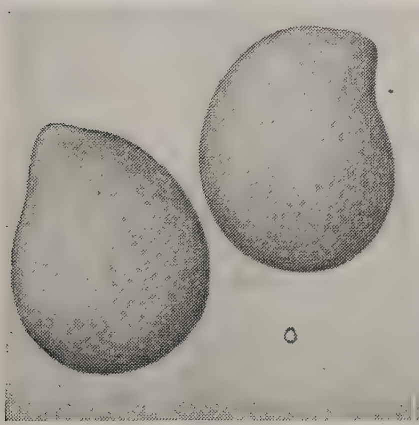
*FALCATULA ORNITHOPODIOIDES (Trigonella ornithopodioides):* Colour light green to yellow with grey to black flecks. Resembling *Trifolium hybridum* in size and shape, and *Trifolium fragiferum* in colour and markings. Occurs with medium frequency in white clover and is becoming more common. An annual clover-like plant found in dry pastures.



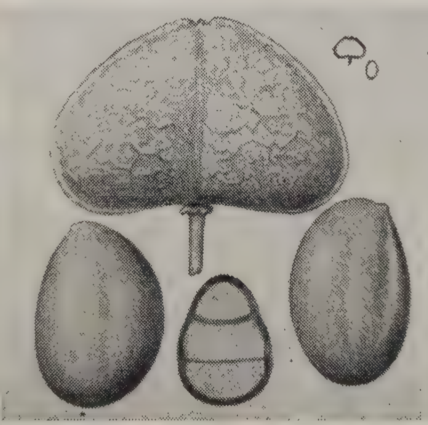
*RUMEX OBTUSIFOLIUS:* BROAD-LEAVED DOCK. Colour dark brown. Occurs frequently in red clover and lucerne. Classed as a secondary noxious weed seed in Canada. Australia admits not more than 20 dock seeds per ounce. A perennial weed most aggressive on heavy land.



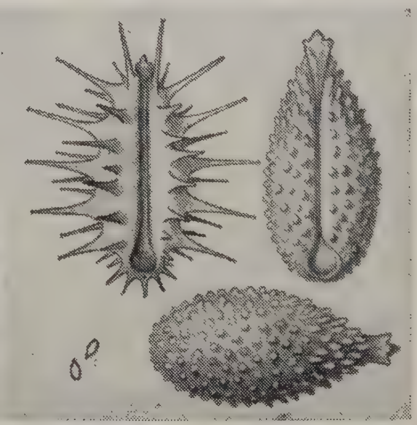
*GALIUM APARINE:* CLEAVERS. Colour grey. Occurs with medium frequency in red clover, beet, cocksfoot, and cereals. In dressed seed the hooked hairs are almost entirely broken away. Australia admits not more than 50 seeds per ounce. An annual weed of cultivated land.



*SOLANUM NIGRUM:* BLACK NIGHTSHADE. Colour light brown. Occurs rather infrequently in clover and peas. Australia admits not more than 20 seeds per ounce. An annual weed, sometimes very aggressive on fertile land. It is especially objectionable in peas and other seed crops, because the dark-coloured berries stain the seed.



*LEPIDIUM DRABA (Cardaria draba):* HOARY CRESS. Colour dark grey to black. Occurs very rarely in red clover and ryegrass. A prohibited weed seed in Australia and Canada, and classified as a noxious weed seed in the United States. A perennial weed spreading by underground stems. It is difficult to eradicate on account of its twitch-like habit of growth.



*TORILIS NODOSA (Caucalis nodosa):* HEDGE-HOG PARSLEY. Colour grey. Outer seeds in the seed head are spiney; the inner seeds are covered with tubercles. Occurs with medium frequency in ryegrass and crested dogstail. Australia admits not more than 50 seeds per ounce. An annual weed of dry pastures.

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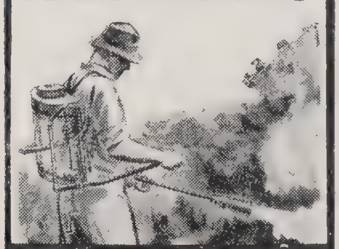

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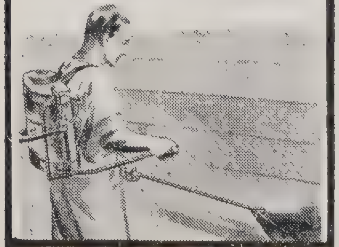
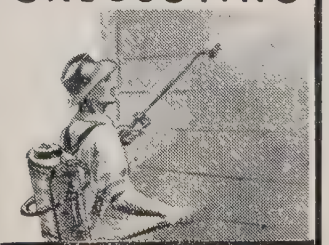
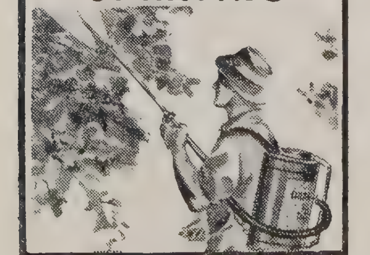


CREOSOTING



SPRAYING



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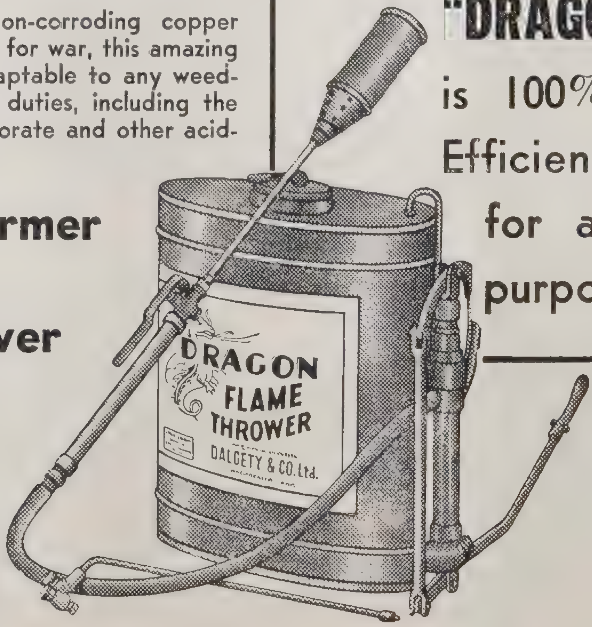

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# The Mowat Lamb Tailer

## Reports on Departmental Trials

*By* T. K. Ewer and J. J. Hancock, *Animal Research Division, Ruakura.*

**THE influence of various methods of castration and tailing of lambs upon their subsequent growth, as judged by live-weight gains, has been investigated by several workers both overseas and in New Zealand (Garner and Sanders, Journal Agricultural Science, 26: 2, 1936; Ewer, New Zealand Journal of Agriculture, 65: 6, 1942). It was found in each series of experiments that the method of tailing had no significant effect upon subsequent weight gain.**

IN the spring of 1944, following a request by the inventor, two trials were carried out, one at the Kirwee Experimental Farm and the other at Mamaku Outstation of Ruakura Animal Research Station, with a docking instrument known as the "Mowat tailer." It was claimed that with this instrument "post marking" losses were reduced, that blood loss was less, and thus that the lamb fattened more quickly.

### THE KIRWEE TRIAL.

### *Method*

Two hundred lambs were selected from a mob whose dams had been run together throughout the winter. After weighing, the lambs were randomised into two groups of approximately equal weight. These lambs were from Corriedale ewes by Southdown rams and were approximately 4 to 6 weeks old. It is realised that most lambs in New Zealand are tailed at a younger age than this, but Mr. Mowat claimed that his instrument was of particular value for use with older lambs. Following weighing and division into two groups on October 6, the lambs were castrated and docked on October 9. The method of castration was by the knife and was performed by one man. The lambs docked by the Mowat instrument were done by the inventor himself. The lambs docked by the knife were done by the officer in charge, Kirwee Experimental Farm. Both operations went on simultaneously. The usual precautions of cleanliness were adopted.

The weather, being still and cool, was suitable for the operation, which was done in a temporary yard especially erected in the corner of a clean paddock. After marking the lambs were allowed to mix with their dams at once. The ewes and lambs were kept together as one mob until weaning in January.

Since any effect upon the lambs' weight due to the tailing operation is likely to be revealed within 10 days, the first weighing after docking was done on October 18. At the same time an examination of the docking wound of each lamb was made to see the extent of healing.

The lambs were subsequently weighed on two occasions approximately 5 weeks and 10 weeks after tailing. Following the last weighing, a fat lamb buyer went through the lambs and picked those that were fit for the works. The following day these were slaughtered and information on dressed weights collected.

### *Results*

It will be seen from Table 1 that there was practically no difference in the behaviour of the two groups:

When subjected to statistical analysis the small difference of 0.7lb. in the two groups is shown to be due to chance and not to the method of tailing employed.

When docking wounds were examined at the first weighing after the operation none of those made by the knife had healed, while 3 of those made by the Mowat instrument had healed over. At the next weighing it was found that 98 per cent. of the Mowat-docked lambs and 82 per cent. of the knife-docked lambs were healed.

TABLE I—LIVE-WEIGHT GAINS.

| | Live Weights in lb.<br>Initial. | After 12 Days. | After 31 Days. | After 101 Days. | Number Slaughtered. | Dressed Weights. lb. |
|---|---|---|---|---|---|---|
| Mowat Group .. | 26.8 | 33.1 | 43.1 | 60.9 | 30 | 32.95 |
| Knife Group .. | 26.9 | 32.6 | 42.6 | 60.2 | 32 | 33.7 |

TABLE II—AVERAGE LIVE WEIGHTS AND LIVE-WEIGHT INCREASES.

| | Live Weights in lb.<br>Initial. | After 20 Days. | After 90 Days. | Total Increase. lb. |
|---|---|---|---|---|
| Knife ewe lambs .. | 27.4 | 38.9 | 68.9 | 41.5 |
| Knife ram lambs .. | 31.4 | 42.5 | 74.5 | 43.1 |
| Mowat ewe lambs .. | 28.9 | 40.4 | 70.3 | 41.4 |
| Mowat ram lambs .. | 31.1 | 43.6 | 75.5 | 44.4 |

### THE MAMAKU TRIAL.

### *Method*

Altogether 117 Southdown-Romney X lambs were included in the experiment. Their age range was 38 to 46 days, averaging 6 weeks.

Docking operations were carried out on October 20. Weather conditions, due to heavy rain and strong wind, were very bad, and prevented weighing of the lambs at tailing.

Mr. Mowat tailed 31 ewe lambs and 27 ram lambs with his patent tailer. The majority of the ram lambs in this group were "cord crush" castrated. The Farm Manager at Mamaku tailed 31 ewe lambs and 28 ram lambs using the knife. Castration of these ram lambs was effected by removal of the testicles.

The Mowat group contained 35 twins and one triplet and the knife group 33 twins and 2 triplets.

### *Results*

The lambs were weighed three times —4 days, 3 weeks, and 13 weeks after tailing. Table II shows average live weights and the total average live-weight increases during this period.

It will be observed that over the initial 20-day period the gains were identical in the two groups of ewe lambs (11.5lb.), but slightly in favour of the group of ram lambs tailed by the Mowat instrument (12.50lb. against 11.10lb.). Over the next 70 days the respective gains were slightly higher in the groups tailed by the knife in the case of both ram and ewe lambs. Thus the "knife" ewe lambs gained 30.0lb. against the "Mowat" ewe lambs, 29.9lb. The "knife" ram lambs gained 32.0lb. against the "Mowat" ram lambs, 31.9lb. Over the whole period the ewe lambs tailed by the knife did slightly better in rate of gain than those tailed by the Mowat instrument, while the ram lambs showed a superiority of 1.30lb. average live weight in favour of the Mowat instrument.

These differences, however, are extremely small in each case, and are obviously not consistent. When the detailed data are subjected to statistical analysis the differences are shown to be not significant—that is, they cannot be taken to indicate a real difference in the two methods of castration, differences of the magnitude concerned being more probably due to random or chance differences in the natural growth rate of the individual lambs included in the trial. It can only be concluded, therefore,

### TABLE III—NUMBER FAT OFF MOTHER, CARCASS GRADES, DEAD OR MISSING, ETC.

| | Fat 1st Cut. | Fat 2nd Cut. | Total Fat | Left on Hand | Died or Missing. | Grand Total. | Carcass Grade. Down. | Carcass Grade. Prime. | Carcass Grade. 2nd. |
|---|---|---|---|---|---|---|---|---|---|
| Knife ewes .. | 20 | 9 | 29 | 2 | — | 31 | 7 | 12 | 10 |
| Knife rams .. | 16 | 8 | 24 | 2 | 2 | 28 | 8 | 8 | 8 |
| Total .. | 36 | 17 | 53 | 4 | 2 | 59 | 15 | 20 | 18 |
| Mowat ewes .. | 19 | 11 | 30 | 1 | — | 31 | 10 | 13 | 7 |
| Mowat rams .. | 16 | 4 | 20 | 4 | 3 | 27 | 8 | 4 | 8 |
| Total .. | 35 | 15 | 50 | 5 | 3 | 58 | 18 | 17 | 15 |

that this experiment has not demonstrated any significant superiority of the Mowat instrument over the knife in so far as subsequent rates of growth of the lambs are concerned.

Table III shows the number of fat off the mother, carcass grades, dead and missing, and left on hand.

## *Discussion*

These experiments serve to show that the small amount of bleeding which is inevitable when lambs are docked with the knife does not adversely affect them, and that their weight gains are not significantly lower than those of lambs which are docked in a supposedly bloodless manner. It was noted that actually only a proportion of the lambs docked by the Mowat instrument did not bleed. The operation was somewhat slower than when the knife was used. Only one lamb (at Kirwee) died within a few days of tailing, which might be attributed to the effects of the operation (this lamb died from blood poisoning and happened to come from the group tailed by the Mowat instrument).

## *Summary*

In two experiments involving approximately 300 lambs, designed to test the effect of the Mowat tailer upon subsequent lamb fattening, compared with docking by the knife, it was found that—

1. **There was no significant difference between the live weights subsequently gained by the lambs.**
2. **Lamb losses were negligible with either method.**
3. **The number of lambs fattened before weaning was practically the same in both groups.**
4. **There was no significant difference in carcass grades.**

In view of these considerations it may be stated that the decision in regard to the use of the Mowat tailer or any other instrument of similar nature should be made solely on whether or not the operator finds it more convenient than the knife.

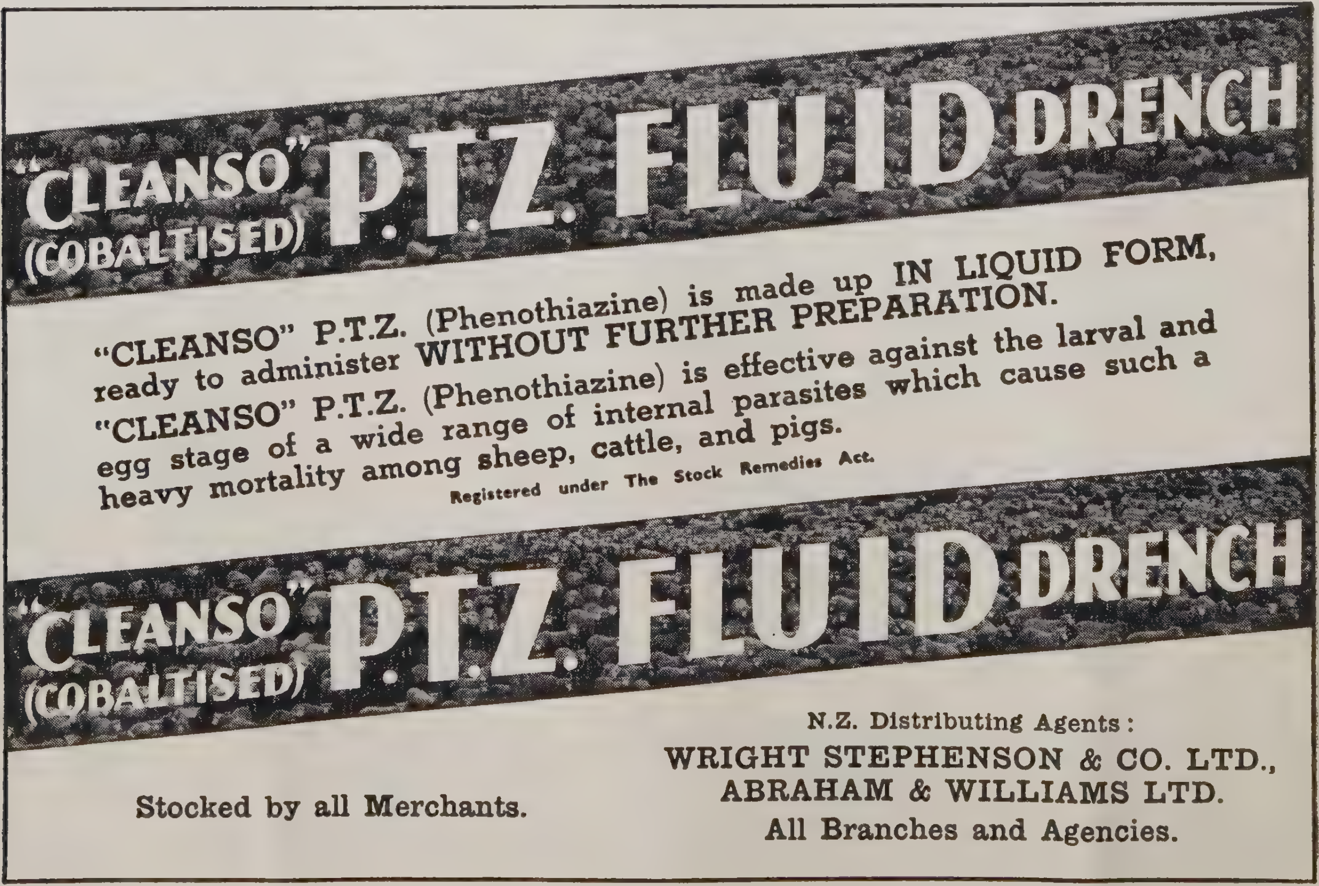
◆

### FENCING MATERIALS

For estimating requirements of fencing material the following figures will be found useful:—

| *Plain Wire* Gauge. | Yds. per cwt. |
|---|---|
| No. 8 | 566 |
| No. 10 | 882 |
| No. 12 | 1333 |
| *Barbed Wire* | |
| No. 12 (3in. barbs) | 450 |
| No. 14 | 725 |

The "effective" length per cwt. is often quoted and is the actual length of fencing that 1 cwt. of wire will cover, allowing for bends, waste, etc. The effective length of No. 8 wire is 484 yds. per cwt.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# BARLEY

*By* R. G. JOLLY, *Fields Instructor, Christchurch.*

IN certain districts in New Zealand where the soil and climatic conditions are suitable for its production barley has become an important crop. It is grown for three purposes: for the production of malting barley, of feed barley, and of greenfeed. New Zealand's requirements of barley for malting and for stock food are about 2,000,000 bushels yearly, and in this article the cultural and harvesting practices which have been developed in the production of the crop are described.

FOLLOWING the introduction of a protected market, a minimum price schedule, and grading standards New Zealand quickly became almost self-supporting in the production of malting barley, but large quantities of feed barley for the pig industry have to be imported each year. In the South Island barley which has been rejected for malting purposes is used as stock feed and any surplus is sold to the North Island, but to meet the deficiency in the North feed barley has to be imported.

In the 1943-44 season a total of 35,811 acres was sown to barley, 7,570 acres being utilised as greenfeed. As a greenfeed crop barley is useful for two main purposes: for the provision of winter and early spring feed and to provide feed in low-rainfall areas during the dry period. Barley has an advantage over other cereals in that it is a rapid grower and recovers quickly after grazing. The Cape and Black Skinless varieties are popular for this purpose.

Of the total area of barley grown in the Dominion 3,913 acres were grown in the North Island, and of this 2,825 acres were devoted to greenfeed, the remainder being harvested and used as stock food. In the South Island a total of 31,898 acres was grown with some 4,745 acres utilised for greenfeed.

From the foregoing it will be seen that the growing of barley is mainly confined to the South Island. The following table shows the acreages grown and the utilisation of the crop in the different provinces of the South Island for the 1943-44 harvest:—

| Province. | Acreage of Barley for Threshing. | Acreage of Barley for Greenfeed. |
|---|---|---|
| Nelson .. .. | 1,491 | 158 |
| Marlborough .. | 3,193 | 227 |
| Canterbury .. | 18,077 | 2,295 |
| Otago .. .. | 4,242 | 1,761 |
| Southland .. | 150 | 304 |
| Total .. | 27,153 | Total 4,745 |

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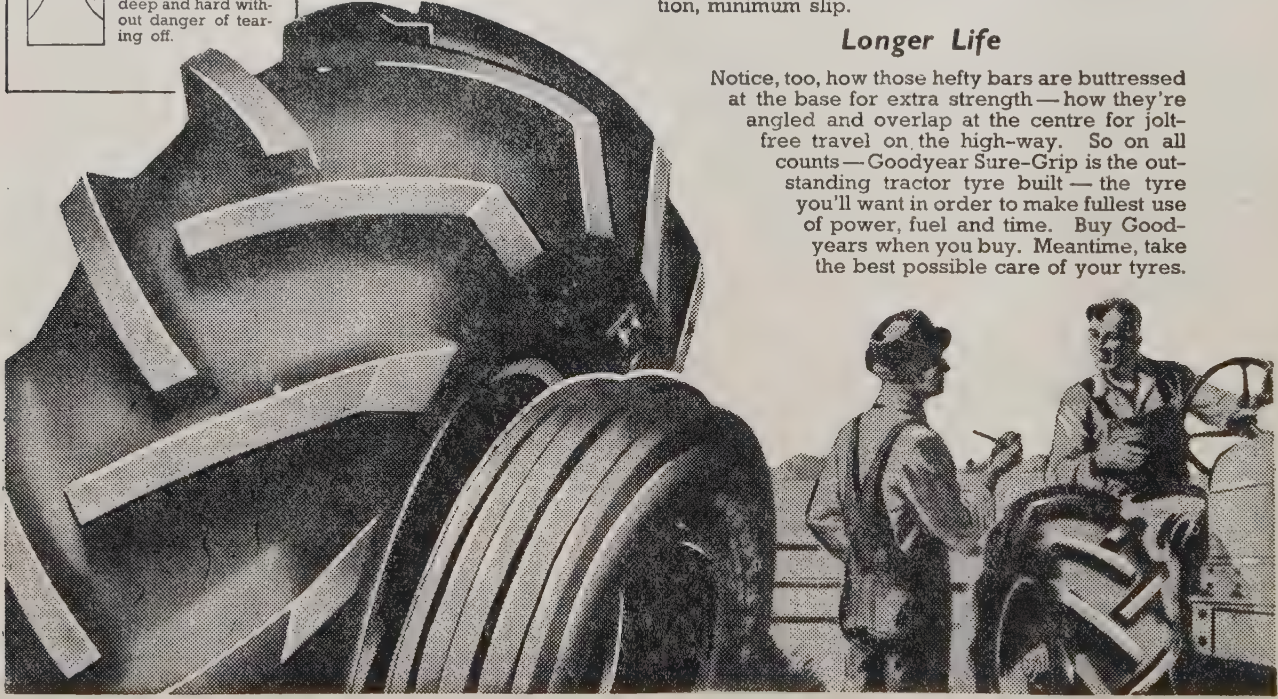

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Because of the suitability of the soil and climate, practically all the barley harvested in the South Island is for malting purposes, only sufficient of the greenfeed varieties being harvested to meet the requirements for seed.

## *Soil and Climate*

Any soil which will yield good crops of wheat or oats in a normal season can generally be regarded as suitable for barley. For greenfeed the crop may be grown on a fairly wide range of soil types, but for malting purposes, because of the high standard of quality of the grain required, the crop has been confined to those districts which have proved themselves to be suitable for its production. The localities considered most suitable for malting barley are Marlborough, Canterbury, North Otago, and parts of Central Otago and Southland. In Canterbury, where the major portion of the crop is grown, the main counties are Ellesmere, Springs, Selwyn, and Ashburton.

The most suitable soils are the uniform medium to rich free-working loams adequately supplied with lime. Climate plays a most important part in the production of good-quality malting barley, and an adequate supply of moisture during the growing season is required. Relatively dry conditions are essential during the harvesting period. Excess rainfall at this time results in sprouted grain or grain in poor condition.

## *Preparation of Seed-bed*

The preparation of the land intended for barley is similar to that required for wheat or oats. The land should be ploughed to a good depth and a well-cultivated seed-bed developed. The amount of work required to be put into its preparation will depend largely upon the type of soil and the preceding crop. On most soils some preliminary cultivation is usually undertaken before the final deep ploughing, but on some of the heavier soils where natural drainage is not good the land may be ploughed only once and allowed to remain in the furrow through the winter. To assist in drainage ploughing is at times done in comparatively narrow lands.

Where the crop is to be spring sown, and the bulk of it is sown at that period, early winter ploughing is desirable, as it ensures good weathering of the soil, and subsequent cultivations interspersed with rolling and harrowing will produce the consolidation and tilth required. It is best to delay this work until the soil is fit, as working wet soil has harmful effects on the seed-bed, especially with some of the stiffer soils.

If the ground is inclined to be weedy, it is sometimes advisable to delay sowing beyond the normal period, so as to allow for a further killing of weeds before sowing takes place, but comparatively few crops are sown later than the early part of November.

## *Place in Rotation*

Barley is generally a spring-sown crop and may follow a cleaning crop such as roots or potatoes or after peas, wheat, or grass. Barley does not demand such a high fertility as wheat and can quite profitably follow wheat in the rotation. In the drier districts barley is often grown after a bare fallow following a previous barley crop. The fact that barley does not compete successfully with weeds often determines the place it takes in the rotation. Barley is often sown on land intended for wheat where sowings of the latter crop have been delayed by weather conditions and the prospects of a good wheat crop are poor. As a catch crop to provide winter feed barley is often sown in the autumn after a cereal or in the early summer (November to December) to provide feed to tide over the dry period in late summer and early autumn when feed is in short supply.

## *Sowing*

Spring sowing usually commences in August and is carried on through September and October. Occasional sowings take place in November, but the prospects of securing a good sample and yield from such late sowings are too uncertain, and it is only where cultural work has been held up on account of weather conditions that such late sowings are practised. Normally the earlier the crop is in, the stronger it is and the better the yield. Occasionally autumn sowing is practised on the lighter and drier soils. In such cases drilling usually takes place in May or June.

For malting barley seedings may range from 1¼ to 2 bushels per acre. These quantities may vary from district to district, the rates adopted being those which have proved most suitable for the locality. The aim should be a seeding which will give a maximum yield of well-developed grain.

For greenfeed, where the main object is the production of a quick bulk of fodder, seedings of 2 to 2½ and even 3 bushels per acre are common, the last quantity being most generally used when the seed requires to be broadcast.

The use of superphosphate at 1cwt. per acre can be recommended. The normal depth of sowing is about 2in., and the land is harrowed following drilling.

Barley is sometimes rolled after the crop is up, when it is considered necessary to level and consolidate the seed-bed. The crop is also harrowed when weeds are prevalent. As barley

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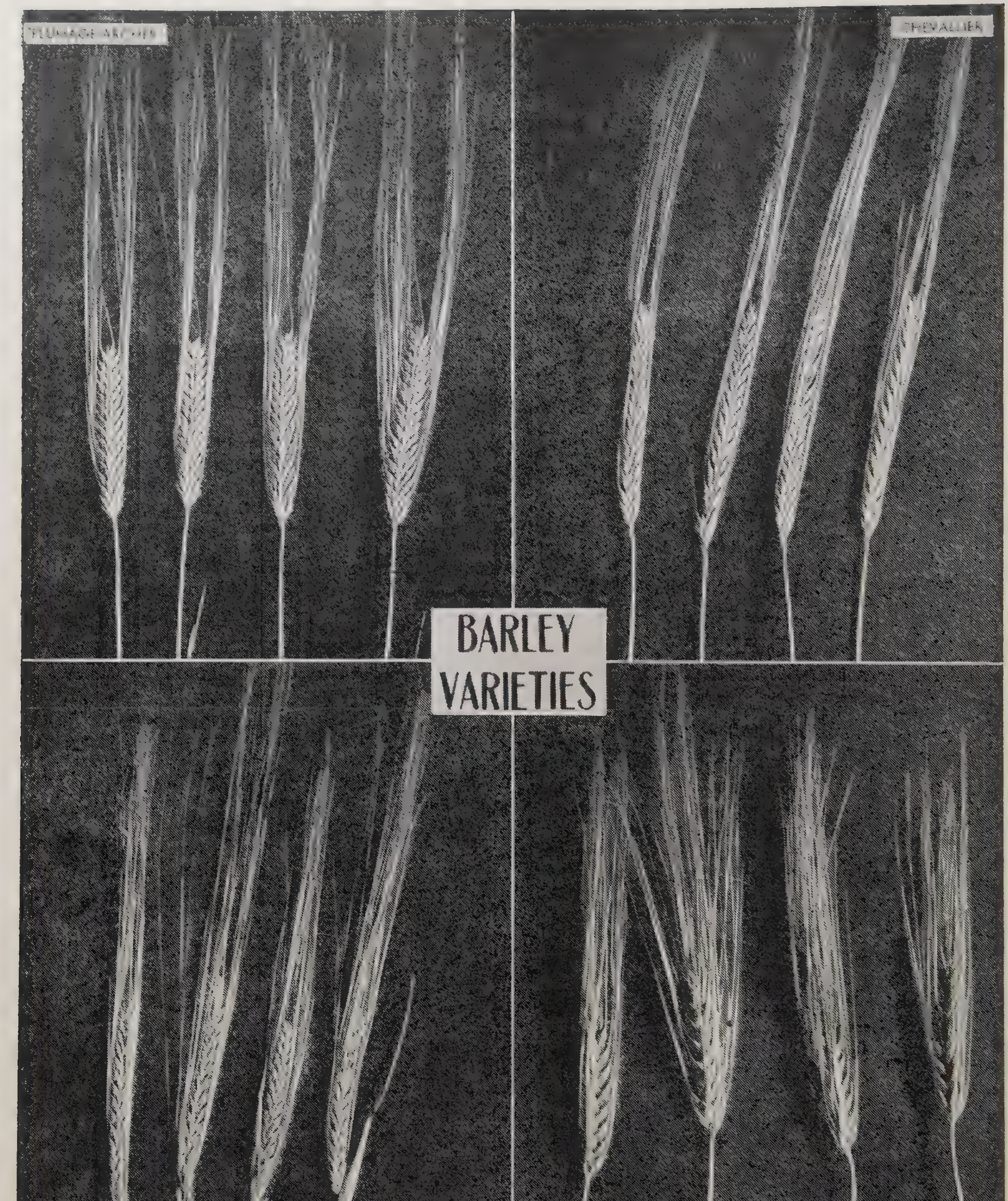

BARLEY VARIETIES

PLUMAGE ARCHER
CHEVALLIER
SPRATT ARCHER
CAPE BARLEY

is rather delicate in the seedling stage, anything in the nature of drastic treatment should, however, be avoided.

## *Varieties*

**Feed Barleys:**

The two varieties most commonly used are Cape and Black Skinless, which are quick growers and produce a great bulk of feed in a very short time. Under normal conditions the crop will be ready for feeding off within 6 to 8 weeks of sowing. Besides producing a bulk of greenfeed, these varieties produce good yields of grain suitable for pig feed, but not for malting. Feed barleys are of the six-rowed type.

**Black Skinless:** This variety is quicker growing, produces a bigger bulk of feed, and recovers better after grazing than Cape barley.

**Cape Barley:** This variety has a longer growing period before running to seed than Black Skinless, and is also more drought resistant.

**Malting Varieties:**

The chief varieties of malting barley grown in New Zealand are those which have proved most suitable for malting purposes not only here but in the main barley-growing countries of the world. They are nearly all hybrids whose parents lacked some essential quality, but when crossed have produced desirable characteristics of both parents. They are all of the two-rowed type.

**Chevallier:** This is one of the oldest varieties and is still giving satisfactory results, as shown by farmers' preference for it over all other varieties. It is tall growing and the head droops when ripe. It produces a plump grain of good quality, but is weak in the straw and tends to lodge on heavy land. Its straw weakness makes it more suitable for the medium to light lands.

**Plumage-Archer:** This is a hybrid which has combined the qualities of its parents, namely the straw quality of Archer and the grain quality of Plumage. It is short strawed and a high yielder of good-quality grain. The head remains erect when ripe, but has a tendency to break off. Its strong straw and its resistance to lodging make this variety highly suitable for growing on the heavy soils, but it can be used for most types of land.

**Spratt-Archer:** This is another hybrid. It is short strawed and a high yielder of very good quality grain. It is largely used for autumn sowing in Central Otago. Because of its straw quality it is suitable for growing on medium to heavy soils. The head of this variety droops when ripe.

**Goldthorpe-Spratt:** This is a variety which has given good results in Marlborough, Southland, and in parts of Central Otago where spring sowing is practised. It is one of the more recent varieties introduced, but is not recommended for the heavier soils because of its tendency to lodge.

Breeding of new varieties has been carried out by the Agronomy Division, Lincoln, and a hybrid which promises well has recently been handed over to a commercial firm for testing and increasing.

Of the four varieties grown Spratt-Archer is considered the best malting quality. The other three, Plumage-Archer, Chevallier, and Goldthorpe-Spratt, are about equal. Of the total area in barley Chevallier occupies 40 per cent., Spratt-Archer and Plumage-Archer 20 per cent. each, Goldthorpe-Spratt 6 per cent., and feed barleys 14 per cent.

## *Securing Reliable Seed*

As over 80 per cent. of the barley grown is for malting purposes, more care has been taken with these varieties than with the feed barleys in maintaining pure stocks of seed. Varietal purity is most important. Most varieties differ in time of maturing, therefore the sowing of impure seed results in a poor sample, which eventually means a drop in the malt extract of the line. Consequently the maltsters and brewers who have the crop grown on contract by the farmer each year select for seed purposes the produce of those crops which are most free from disease and varietal impurities. Thus a supply of seed of satisfactory purity and relatively free from disease is made available to growers.

## *Disease and Control*

The most common diseases of barley are covered smut, loose smut, and leaf stripe.

**Covered Smut:** Diseased grains are filled with a mass of black foetid spores which are blown about by the wind and spread by threshing machines. Since the spores adhere to the outside of the grain, they can easily be destroyed by one or other of the cheap and effective fungicides.

The dusting of the seed with one of the proprietary organic mercurial dusts is the simplest and most common method of seed treatment and one which can be recommended. It is easily undertaken by the farmer himself if he has a suitable type of agitator, but practically all lines of seed are now treated by this method before being sent out to the grower. The dust is applied at the rate of 2oz. per bushel of seed.

Another method of seed treatment is to use either a formalin or a bluestone solution. In the former case a solution of one pint of formalin (40 per cent. concentration) in 40 gallons of water can be sprinkled on a heap of grain on the floor, 1 gallon per bushel, or the grain can be immersed in a trough for 10 minutes and allowed to drain for at least 12 hours before sowing. If using the trough method, half-bag lots should be used. Germination of the seed is affected, especially if the seed is allowed to dry. In the latter case 1oz. of bluestone per quart of water is sprayed over a bushel of seed and the seed well mixed. If used as a steep, a 1 per cent. solution should be used (1lb. to 10 gallons), and the seed allowed to soak for 10 minutes. Bluestone lowers the germination.

Covered smut is also controlled by hot water treatment (see below).

**Loose Smut:** This disease is characterised by a loose mass of black spores which, when blown away by the wind, leaves the bare stalk. The disease is internally seed borne and cannot be controlled by fungicides, the only means of control being by hot water treatment, which consists of presoaking the seed for 5 hours at 70°F. followed by five minutes at 127°F. This is a somewhat intricate process requiring special knowledge and equipment and should not be attempted on the farm. In recent years maltsters have treated a high proportion of the seed in this way and disease in the malting varieties has been almost eliminated.

**Leaf Stripe:** This disease is characterised by the striped appearance of the leaves. The stripes are first yellow, but turn brown, and finally the leaf splits along these lines. The ears of infected plants often fail to develop

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●

*McCormick*—Sections, Ledger Plates, Fingers.
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*The above are English and American manufacture and are available from stock.*

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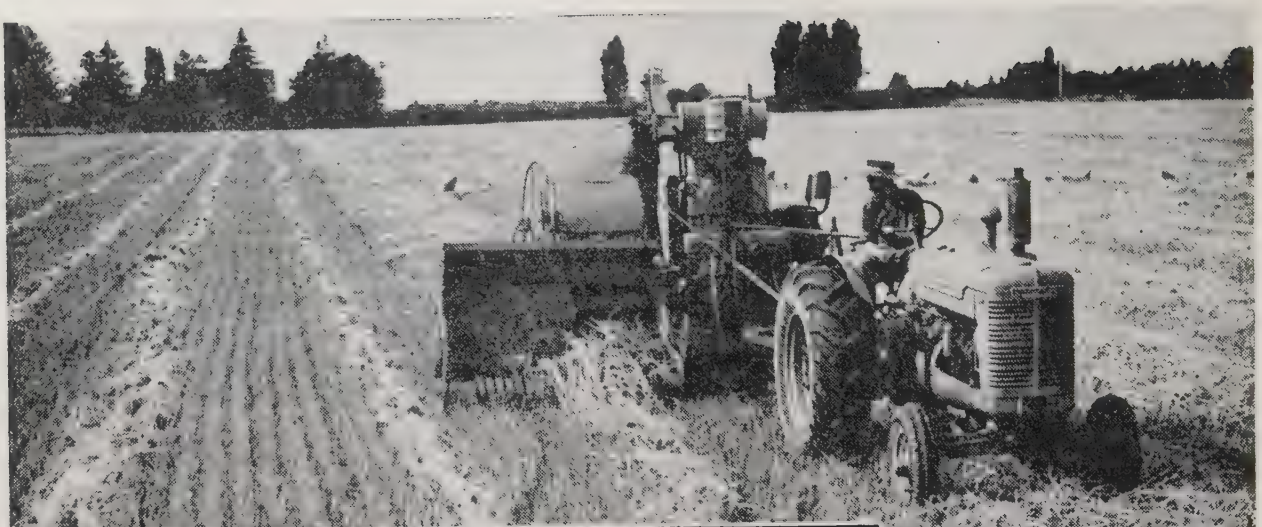
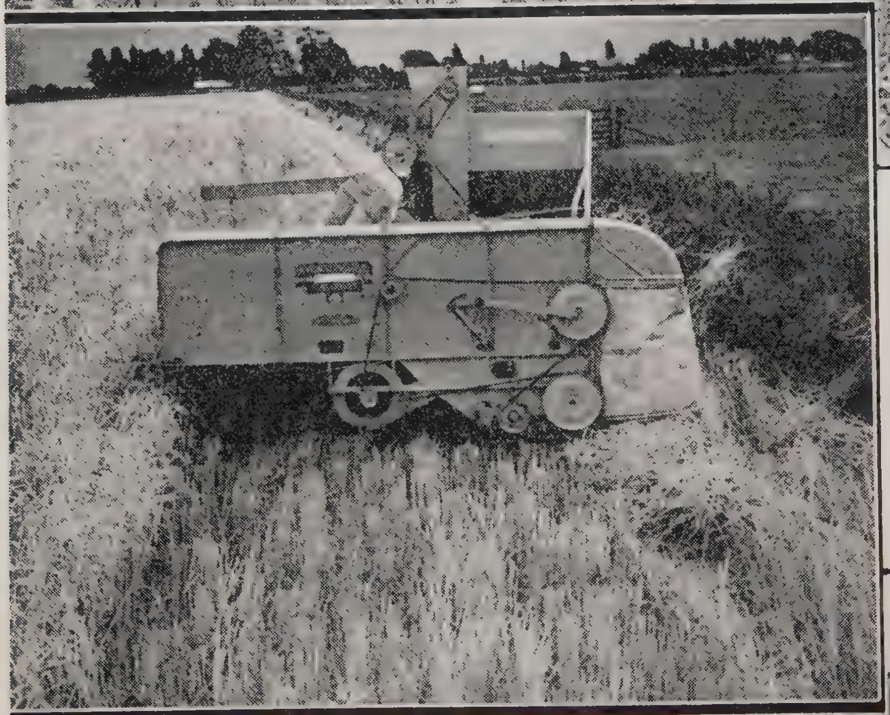




Upper—Threshing barley from windrow with header harvester with pick-up attachment.

Middle—Direct heading a crop of barley.

Lower—Sacks of barley left in the paddock after being threshed with the header harvester.

and sometimes do not emerge from the sheath. The plants are stunted in growth. There is no effective means of control.

Two other diseases of lesser importance are "rust" and "take all." There is no means of control for rust and the incidence of the disease is due to climatic conditions. Take all can be controlled only by crop rotation.

## *Harvesting*

Barley should be fully ripe before cutting. At this stage all green colour has disappeared from the straw and the grain is hard and the skin finely wrinkled. The above is only a guide; the exact time to cut must be left to the individual. Where ripening is uniform no difficulties are presented, but crops which are uneven in ripening because of variation in soil present problems. Most of the varieties grown today can be left with reasonable safety until fully ripe before cutting. It is only in the case of uneven ripening or where the variety sown has a tendency to break at the neck if left too long that the farmer is faced with the question of when and how to harvest his crop without loss.

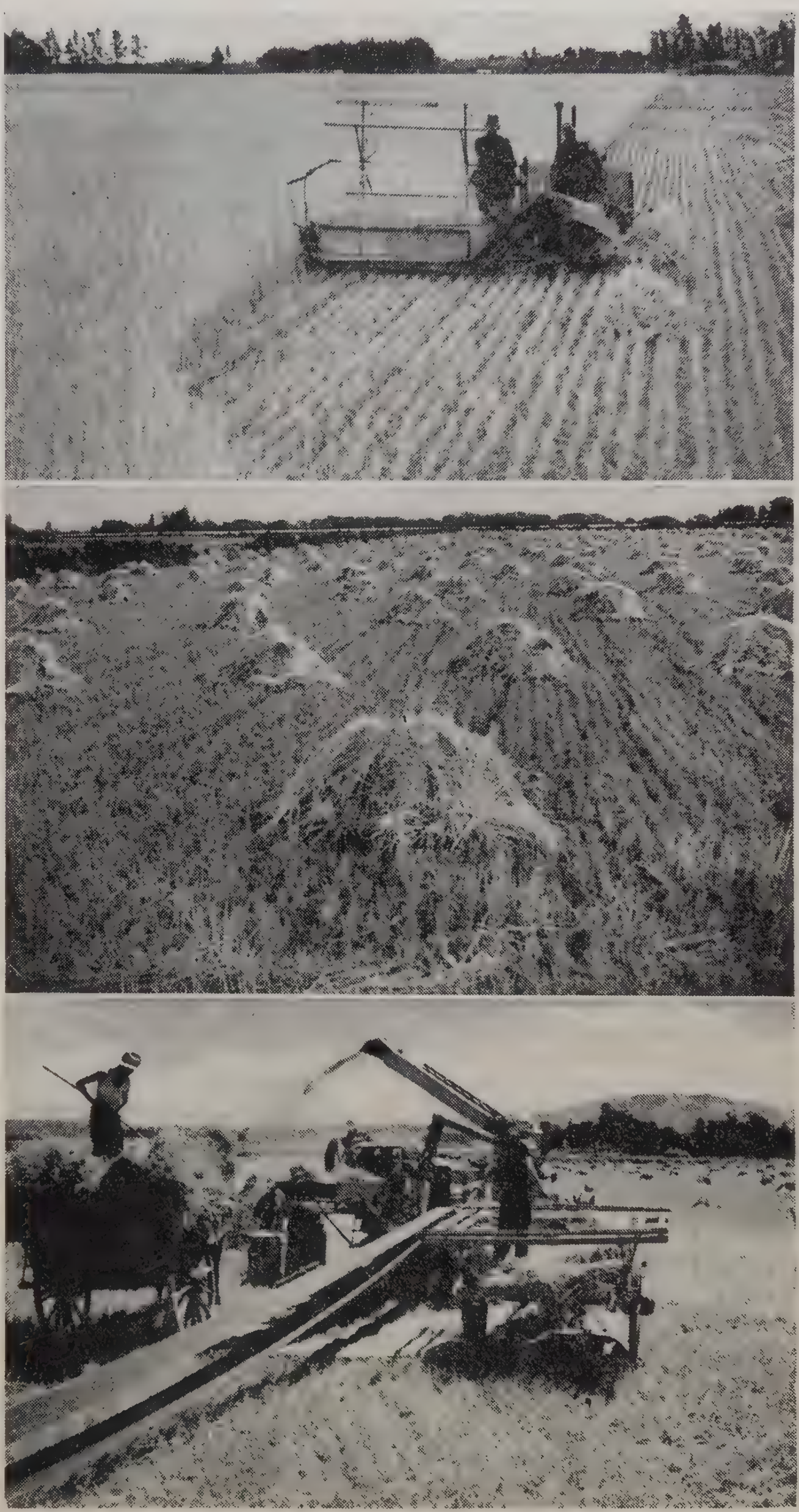
The most common practice is to cut with the binder and to leave in stook from 7 to 14 days or longer according to weather conditions. The crop may then be stacked or threshed from the stook. Another method is to windrow the crop and to thresh from the windrow with the header harvester with pick-up attachment. Direct heading of the crop is not common, although this means of harvesting is increasing. For direct heading the crop must be even and left beyond the stage considered ripe for binder cutting. With the varieties grown at present the danger from wind damage and consequent loss is too great to make this method popular.

The brewers and maltsters prefer barley from a crop which has been stacked rather than stook-threshed, windrowed, or direct-headed grain. They prefer grain threshed from the stack because while in stack the moisture content evens up and the grain germinates evenly when malted.

## *Threshing*

It is often at this stage of harvesting that good crops are ruined, both for malting and for seed purposes, and the grower finds that instead of having grain of good malting quality or a good germinating line of seed, he is obliged to sell the grain for stock food. In many cases the germ is removed or badly damaged and this affects the germination capacity of the line, or the grain may be cracked or skinned. These features are all important to the maltsters. Grain which has had the germ removed will not

# HARVESTING BARLEY



Upper—Cutting crop with binder. Middle—Crop of barley in stook. Lower—Threshing barley from stook.

# Education for the Country Child

Special assistance is available from the Education Department to help country children obtain a full education. This assistance includes:–

★ **BOARDING ALLOWANCES:**

For children who cannot attend any school (either primary or secondary) unless they live away from home The allowance is now 10/- for each week's attendance at school while the child is boarding

★ **SECONDARY SCHOOL BURSARIES:**

For country children who desire to attend schools from which they can be accredited to the University or at which they can take a course leading to the University Scholarship They must (1) have passed the School Certificate or higher examination, (2) be unable to attend an accrediting school unless they live away from home, and (3) take a course leading to University Entrance or Scholarship. The bursaries are worth £40 a year for a maximum of two years.

Applications from qualified pupils (or those awaiting the results of the recent School Certificate examination) should be sent to the Education Department without delay

★ **CORRESPONDENCE SCHOOL:**

For children who live in remote places or who for any other reason cannot attend school. The Education Department's Correspondence School is equipped to take children through all stages from the infant room to University Scholarship standard.

• • • • • •

It should be noted in relation to the Boarding Allowance and the Secondary School Bursaries that the final decision whether or not it is necessary for a pupil to live away from home rests with the Education Department.

Further information can be obtained from Headmasters of schools or from the Education Department, Wellington, C.1

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germinate and the broken and cracked grains develop mould on the malt floor and this impairs the quality of the malt.

The presence of such damage is usually caused by setting the concave too close to the drum or driving with too high a drum speed. For efficient threshing it is advisable to reduce the drum speed below that required for threshing wheat. While it is necessary to reduce the speed of the drum, it is highly desirable to maintain the high speed of the shakers to assist in the separation of the grain from the straw. This may be achieved by an adjustment to the pulley which drives the belt to the shaker shaft pulley. With the variations in crop, and the changing of humidity and temperature frequent adjustments to the setting of the concave or alteration in drum speed may be necessary during the day's threshing to avoid injury to the grain. Regular feeding is also important. A good malting sample is one which is dry, plump, bright, sound, and free from other seeds. Too close clipping will give a better bushel weight but usually results in skinning. A little of the awn should be left on the grain.

If the grain is for malting, it is left in the field after threshing until inspected by the grain buyer, who grades it according to sample. If accepted, it is delivered to the buyer free on trucks or in store according to the district. If rejected, it is disposed of by the grower as feed barley.

## *Grades*

There are four grades for malting barley. Certain standards have been set up to cover the requirements of these grades and each grade is covered by a minimum price. Each year the Barley Advisory Committee fixes a minimum price for malting barley. The grower has the right of appeal, and appeals against grading can be made through the Department of Agriculture.

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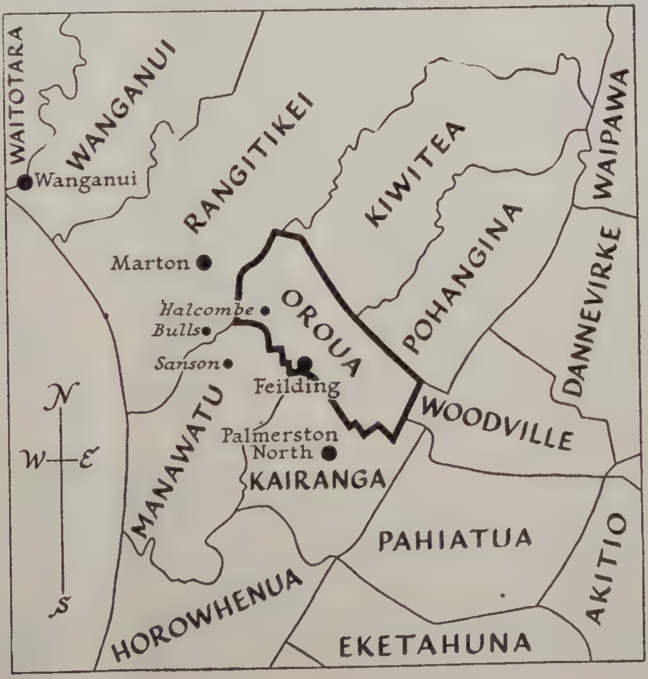
# STUDIES IN FARM MANAGEMENT

# A Halcombe Mixed Farm

**SOILS of the Oroua County are highly fertile and eminently suited for the growing of wheat and seed crops and for fat lamb production. Drainage is imperative because of the impervious subsoil, and if mole drainage is carried out before sowing to good grasses, the land will hold highly-productive pastures for 10 years or more; but with the great success attending fat lamb production in the district and the need for young pastures, most farmers plough regularly, take out a cash crop, and resow, thus keeping both stock and crop output at a high level. The great increase in production that can be achieved in the district by good management is evident in the following study of a typical wheat and fat lamb farm in Oroua County.**

SEVENTY-FOUR years ago the Oroua County was still largely covered with heavy bush—tall matai and rimu, tawa and tree ferns, with occasional giant totaras. For centuries fallen leaves of the bush had built up the fertility of the forest floor until no more luxurious forest could be found anywhere in the North Island. Land-hungry settlers, recognising the possibilities of the area, came in 1874 with their families and their few possessions, and the silence of the bush was shattered by the ring of many axes and the crash of falling trees.



By H. deO. CHAMBERLAIN,
*Instructor in Agriculture,*
*Palmerston North.*

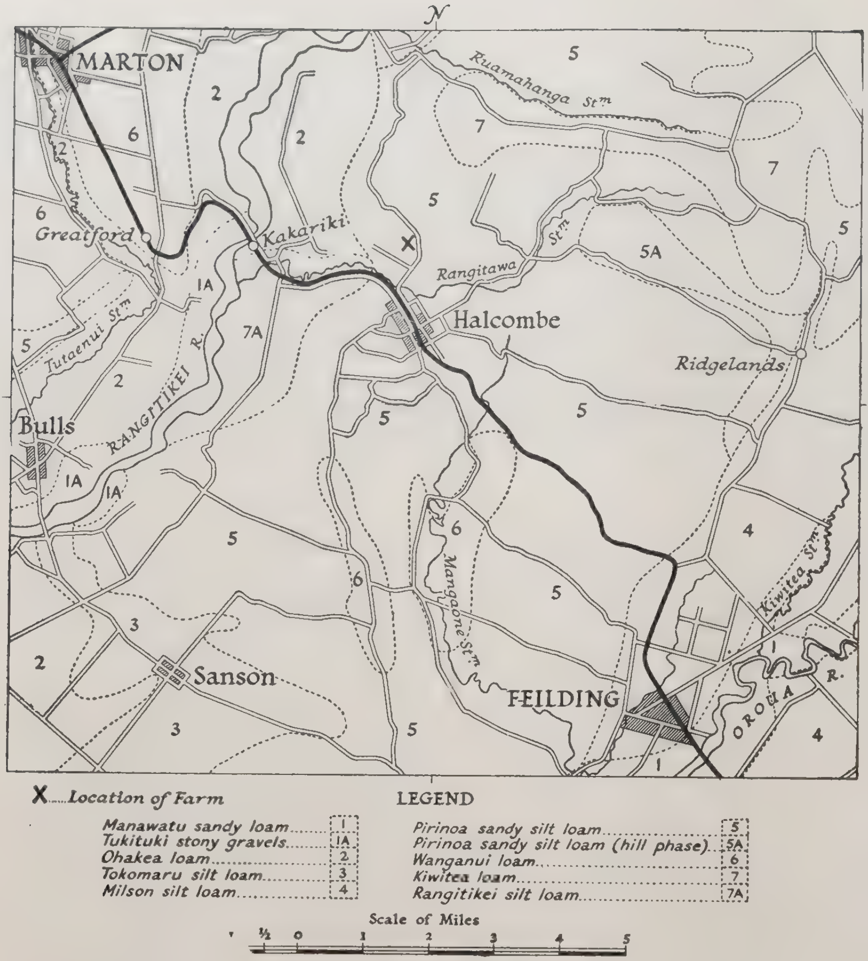
In the Halcombe district of the Oroua County, about which this article is chiefly concerned, the number of settlers had increased from 429 in 1874 to 1,600 three years later, and the development of the area had begun in earnest. The Oroua is a long narrow county bounded on the north-west by the Rangitikei River, whence it extends to the south-east to a point just over the Manawatu River. It is bisected by the Oroua River. The eastern boundary is roughly defined by a line running from the Rangitikei River, near Rata, through Cheltenham to the Manawatu River; and the western from the Rangitikei through Mount Biggs and Feilding along Stony Creek Road to Ferry Road, just across the Manawatu River.

## Soils

About two thirds of the county is rolling country and the soil on these downs is a Pirinoa sandy silt loam, consisting of about 6in. of blackish-grey sandy silt loam over a compact subsoil of mottled clay loam. It is highly fertile and eminently suited to the growing of wheat.

On the banks of the Manawatu and Oroua Rivers there is about a half-mile wide strip of a brownish-grey sandy silt loam on sandy loam subsoil. There are small areas here, too, which consist of 6 to 12in. of grey stony loam over gravel.

The remaining third of the county—a strip three miles wide which runs from Cheltenham to Feilding on the north bank of the Oroua River—is mostly flat or slightly undulating, with soil of the Milsom silt loam type, which is 7in. of brownish-black silt loam over clay loam.



In the bend of the Rangitikei by Tokorangi in the Halcombe district there is a small pocket of a soil type known as Ohakea loam, consisting of 6in. of dark grey loam, 20in. of brownish-yellow clay loam, and 6in. of sandy loam over gravel.

## *Drainage*

All these soils are low in phosphate and have very compact subsoils. Drainage is of the first importance and must be attended to before sowing to good grasses.

Fortunately the subsoil over most of the county is well suited for mole drainage, and the fact that the rolling country provides a natural run-off towards creeks makes this form of drainage comparatively simple. The majority of the mole drains are pulled about 9ft. apart at an angle across the fall of the downs. In the low spots tiles are laid to carry the water away to creeks or main drains, the moles being pulled straight over the top of the tile lines.

Another system, now becoming more general, is the McLeod system of mole draining, the main feature of which is the collecting of several minor moles into major mole drains and allowing two or three majors to run into one outlet, which is tiled. This has the great advantage of reducing the number of outlets and therefore the damage to the land immediately about the outlets. Moreover, the tiling of the outlets reduces the possibility of blocking.

Mole draining is also quite successfully carried out on the flatter areas where the fall is not less than one in 300. These drains tend to silt up at the end of three or four years, but the improvement of pastures coupled with the reduced poaching makes mole draining even at these intervals highly profitable.

## *Pasture Establishment*

In the early days pasture seed was sown after the bush had been felled and burned. At first only limited areas of pastures were sown, most of the cleared land being used for vegetable and grain crops for human consumption. The seeds chiefly sown were cocksfoot, ryegrass, Yorkshire fog, white clover, and trefoil, but under conditions of poor drainage the swards deteriorated fairly quickly and rushes made an appearance, necessitating the breaking up of the pastures, cropping, and resowing.

Today, with improved facilities and methods for draining, pastures will hold the best grasses for 10 years or more, but owing to the common practice of fat lamb raising and the consequent desire for young pastures, most farmers plough their pastures at regular intervals, take out a cash crop, and resow. This is particularly the practice on the rolling country, on which excellent crops of wheat can be grown.

The introduction of long-lived, high-producing strains of grass, however, together with the brisk demand for the seed of these strains, has caused a general tendency towards keeping pastures down for longer periods, and cropping has declined in acreage by about half over the past 10 years.

## *Manurial Practice*

Manurial practice has varied considerably in the past, at least as far as the kind of manure used. Farmers have realised the need for phosphate if pastures are to be kept in maximum production. In the Oroua County generally large quantities of basic slag have been used and ground rock phosphate was also a favourite manure, while blood and bone manure was also applied to pastures in fair quantity.

In later years, however, the practice of using superphosphate in place of the manures mentioned has become general, the value of the quicker, more evenly-balanced returns having made itself plain. Lime also is becoming very much more widely used, and the standard practice for the county is to apply 1 ton of carbonate of lime after ploughing and 5cwt. annually as a topdressing. The superphosphate is generally applied at the rate of 3cwt. with the seed with an annual topdressing of from 2 to 3cwt.

**LAND AREAS, CROPS, PASTURES, AND LIVESTOCK, OROUA COUNTY, 1942***

| | |
|---|---|
| Area in pasture | 98,756 acres. |
| Area under cultivation | 3,366 acres. |
| Sheep population | 248,454 |
| Dairy cows in milk | 11,424 |
| Other cattle | 30,394 |
| Pigs | 3,642 |
| No. of holdings | 634 |
| Average size of holdings | 167 acres. |

*A. and P. Statistics, 1942.

## *Climate*

The climate of the Oroua County is mild, the maximum frost recorded being 11 degrees. High winds are common from November to January, and shelter for both stock and homesteads is necessary. The rainfall averages 35.8in. per year, the lowest falls being recorded in December, January, and February. The following table gives the average rainfall for 10 years.

|  | Inches. |  | Inches. |
|---|---|---|---|
| January | 2.0 | July | 4.0 |
| February | 2.2 | August | 3.2 |
| March | 2.5 | September | 3.3 |
| April | 3.0 | October | 3.4 |
| May | 2.8 | November | 3.6 |
| June | 3.5 | December | 2.3 |
| Total | 35.8 inches. |  |  |

### A FAT LAMB AND WHEAT FARM.

As a typical fat lamb and wheat farm, one in the Halcombe district has been selected for the purpose of this study. Situated 1 mile from Halcombe railway station and 8 miles from the Feilding sale yards and freezing works, it is well placed for communications both by road and rail.

The country is of the easy rolling type and the whole area lends itself to cropping and seed production. The farm is of 222 acres, well divided into 14 paddocks, apart from the shed and homestead area.

## *Water Supply*

Water is supplied from simply-constructed but well-built dams made by a contract-supplied bulldozer in places where water collects naturally, the excavated soil being used to form the banks. Outlets are formed on hard ground where the shoulder of the dam meets the hill and may be open if the dam is formed on a natural water channel or, if not, are piped to the nearest creek by drainage tiles. Cleaning is done by horse scoop.

Water enters the dams from the natural drainage from the side of the slopes and also, in some cases, through tile drains led into the dam. There is a plentiful supply all the year round and this method of watering is found to be efficient and economical. Each dam on this farm waters two or three paddocks, with the exception of two small ones which cater for individual paddocks.

## *Soil*

The soil is in the Pirinoa section of yellow-grey loams. The topsoil, when drained, is free and about 8in. deep. The subsoil is a compact mottled clay, ideal for mole draining and for wheat growing.

## *Drainage*

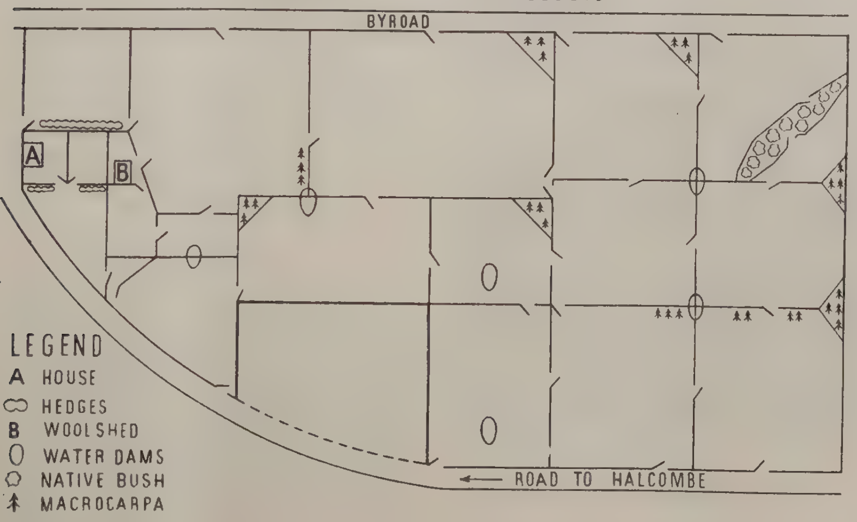
Drainage is of the utmost importance in the farming of this country, as without it the impervious subsoil keeps the surface extremely wet, breaking down the "crumb" structure of the topsoil during cultivation and causing severe poaching under cattle grazing. Undrained, this soil will not hold white clover and the better English grasses, but quickly reverts to heavy rushes.

Because of its efficiency and cheapness, mole drainage is used for all except the lowest spots, where tile drains are employed. These tiles serve a dual purpose, as they not only remove the water from the lower levels, but act as an outlet for the mole drains.

The method employed is to lay the tiles first, from the lower levels to the nearest creek—often one outside the boundary of the farm—and fill in the drain with topsoil. Moles from the higher slopes, which are pulled at an angle across the face, cut straight across the filling of the tile drains above the tiles, and water coming from the moles falls into the tiles and is carried to the creek.

Moles are pulled 6 to 8ft. apart. On long stretches of 15 chains or more this spacing would cause too great a volume of water to flow into the tiles on the low levels, so another set of tiles is laid at an angle half way up the slope and is led to the lowest part of the gully or direct into the creek, where possible, so reducing the direct flow of water by half.

PLAN OF FARM



Where convenient some of the collecting tiles are led into a dam to increase the water supply there, being taken in at an angle round the shoulder of the dam to prevent the water from backing up into the tiles and causing them to flood.

That this method is as efficient as it is simple for the type of country is shown by the fact that moles pulled 15 years ago are still running freely.

## *Stock Management*

Each year the broken-mouthed ewes are fattened and sold, being replaced on the average with 300 2-tooth hoggets which are brought in from hill-country farms. This practice is a departure from the usual custom of purchasing full-mouthed ewes, as it is considered that by buying 2-tooths the flock is kept to a younger level throughout, the wool clip is better, and mortality is lower.

Since fat lambs are the desired object, Romney ewes are mated with Southdown rams, the result being quick-growing, full-bodied lambs eminently suited for the overseas trade.

The wool clip averages 10lb. per head.

No food is bought in, 100 per cent. of the lambs selling fat off the mothers. The lambing average is slightly better than 100 per cent.

Stock carried during the season 1944-45 comprised 1,000 ewes, 26 rams, 60 cattle, 3 bulls, a house cow, and 8 horses.

Fifteen hundred lambs were sold fat, of which 1,100 were bred on the farm and 400 were bought in. The cattle used are dairy heifers purchased in the autumn and sold the following autumn as springers—a very fruitful source of income besides ensuring adequate pasture control.

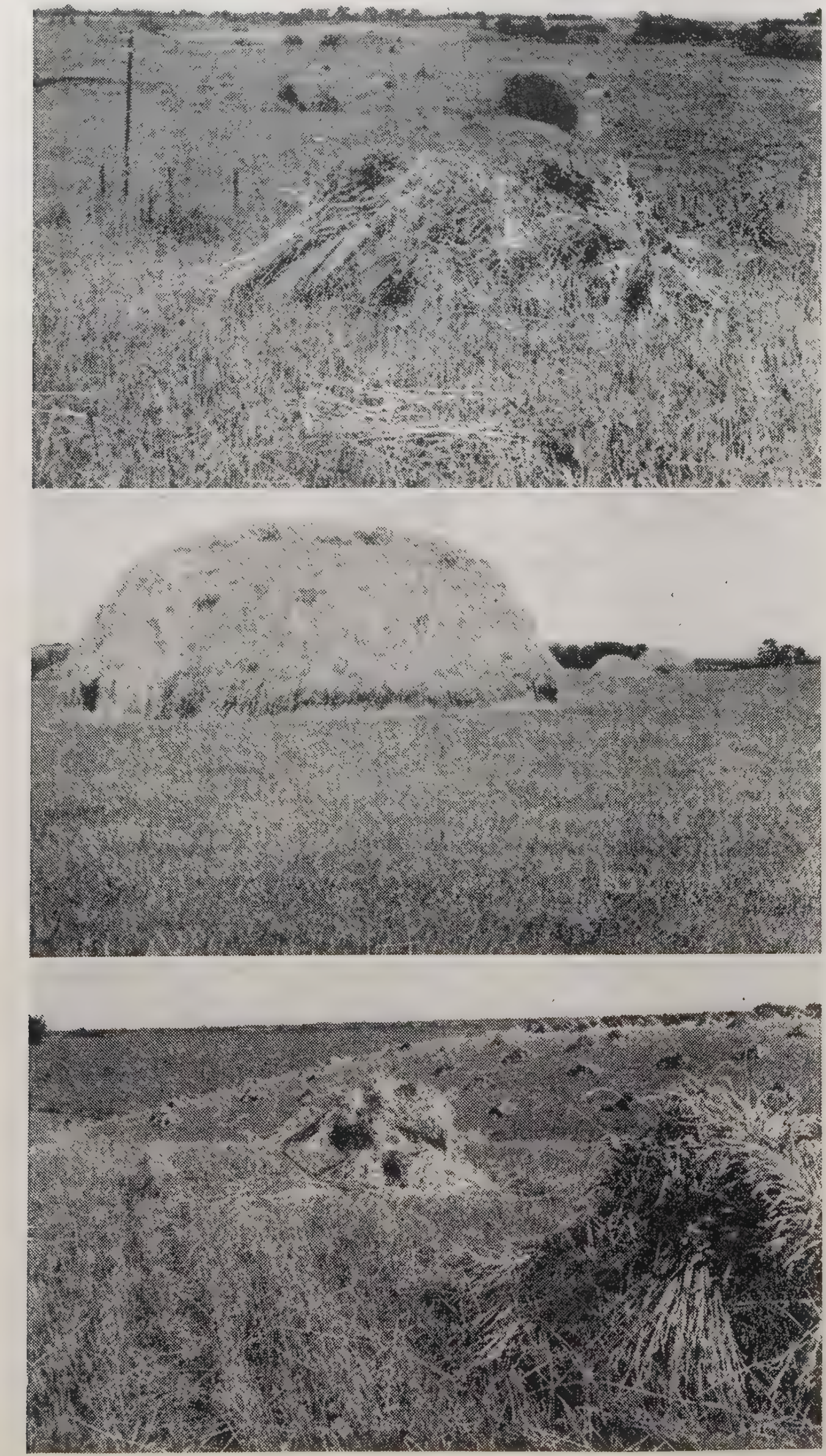
Dry sheep are shorn about the middle of October, followed by the wet sheep in December, the broken-mouths and culls being fattened and replaced.

## *Crops and Rotation*

The main object of the farm is the production of fat lambs and wool, and all other activities are directed to this end. Thus about 15 acres of mixed swedes and chou moellier are grown every year for winter sheep feed; 5 acres of oats (Algerian) for horse feed and about 40 acres of wheat are grown to break in old pastures for new grass. About 12 acres of the wheat land is set to wheat again, a catch crop of chou moellier or turnips being taken between the two white crops to improve fertility and provide extra feed. In addition about 3 acres of mangolds are grown to supplement grass when the ewes are heavy in lamb.

For this soil and somewhat uncertain climate, the most suitable variety

# VIEWS OF THE FARM



Upper—Type of country. Middle—Hay stacked for baling. Lower—Tainui wheat crop that yielded 50 bushels per acre.

of wheat has proved to be the New Zealand selected Tainui, which yields, on the average, 50 bushels per acre of excellent quality grain. Tainui is a tight-chaffed, strong-strawed wheat resistant to rough winds and lodging. Within 2 years of its appearance Tainui had completely replaced the former favourite, Jumbuck, which Tainui, apart from its stronger characteristics, also out-yielded.

Wheat is harvested with a horse binder on this farm and is invariably saved in good condition. A power binder makes sheaves which do not shed rain so easily, and the pick-up combine is not suitable in a climate of frequent showers. Direct heading of wheat is being more widely adopted because of the labour shortage, but is not to be compared with the horse-drawn binder for security in harvest.

The main crops are swedes and chou moellier for winter feed, and wheat for preparing old pastures for resowing. To achieve this end a simple rotation is followed bringing swedes and chou moellier out of grass, followed by wheat, and then back into grass. If it is desired to take two crops of wheat from any specially strong paddock, this rotation is varied by ploughing the stubble of the first crop in February as soon as the crop is removed, working down immediately, and sowing at once to chou moellier or turnips. These are fed off during July-August-September and the area worked up at once for the second wheat crop.

This practice keeps the land in full production, obviates a period of fallow, provides extra sheep feed, and ensures that the second wheat crop does not have such an exhausing effect on the soil as to spoil the following sward of grass.

For wheat 1cwt. of superphosphate to the acre has proved to be an ample dressing, and 2½cwt. of slag and superphosphate mixed is sown with forage crops.

## *Pasture*

A standard seeds mixture, used for all paddocks, is as follows:—

| | | lb. |
|---|---|---|
| Govt. certified | ryegrass .. .. | 30 |
| " " | white clover .. | 3 |
| " " | cocksfoot .. .. | 5 |
| | Timothy .. .. | 2 |
| | Crested dogstail . | 1 |
| | Per acre .. .. | 41lb. |

The farmer finds that a fairly heavy seeding of grass is required on this country to smother any rush seedlings that may germinate, the farm being under dense rushes when taken over. As a further protection against rush invasion it has been found necessary to sow grass only on alternate ploughings—third, fifth, and so on—which ensures that the bulk of rush seeds will be well under the soil at the time of grass-seeding instead of on or near the surface.

## *Topdressing and Manuring*

The need for good dressings of phosphate is shown by the rapid deterioration of even the best-prepared pastures sown with highest-grade seeds if topdressing is not carried out. On this farm no grass seed is sown without a dressing in normal times of 2½cwt. of superphosphate with the seed.

Lime also is deficient in Halcombe soils, and on this farm 2 tons per acre are applied after ploughing and worked into the soil before sowing.

As a topdressing, superphosphate at the rate of 2½cwt. is applied every year, varied every third year with 3cwt. of basic slag. This practice is thought to assist in keeping a better-balanced pasture under the conditions of grazing on this farm.

## *Hay and Grass Seed*

The quantity of hay and grass seed saved depends chiefly on the need for control of pastures in the best interests of the stock. The acreage, therefore, varies with the type of season, but averages 20 acres of hay and 35 acres of grass saved for seed, the threshed straw of which is also fed to stock. Yields of hay average 2 tons per acre and of ryegrass seed about 20 bushels dressed weight.

The climate is unsuitable for the saving of white clover seed as a crop, since the certified strains tend to keep making leaf under the stimulation of summer showers and throw comparatively little seed.

Hay is baled by contract from the paddock, or else stacked in paddocks convenient of access. Almost all hay is used for winter feed, any surplus being held in stacks for an emergency.

Grass for seed is cut with a binder during January and threshed with a stationary mill about 10 days later, a method which has the advantage over the use of pick-up harvester combines, as it ensures the saving of the crop in spite of the unsettled weather which occurs frequently about this time.

## *Cultivation and Labour*

Ploughing is done with teams of horses because it has been found that large areas can often be ploughed when weather conditions prevent the use of tractors, especially on some of the steeper downs. Discing, on the other hand, is done by contract with a tractor, as it is considered quicker and cheaper than using horses. After that horses are used for all cultivation and harvesting work.

# FURTHER FARM VIEWS

**Upper—Certified white clover aftermath. Middle—Water is supplied by dams. Lower—Macrocarpa plantations are grown in all corners for shelter and timber.**

PRODUCTION AND CARRYING CAPACITY INCREASES.

| | Ewes. | Cattle. | Horses. | Other crops.<br>ac. | Wheat.<br>ac. | Hay.<br>ac. | Grass seed.<br>ac. |
|---|---|---|---|---|---|---|---|
| 1929 (farm taken over) .. | 500 | 1 | — | — | — | — | — |
| 1935 .. .. .. .. | 800 | 30 | 8 | 10 | 15 | 12 | 10 |
| 1944 .. .. .. .. | 1,000 | 60 | 8 | 18 | 30 | 13 | 25 |

Permanent labour consists of the owner and one man, with casual labour brought in for the harvest.

### *Farm Shelter*

This farmer takes a long view in the provision of shelter and plants trees which will produce good timber for fencing and general farm use as well as providing good shelter. At present there are 12 plantations in the 14 paddocks, placed in the corners where the plough cannot go. The trees are mostly macrocarpa, but in one paddock a less accessible spot has been left in native bush. Further plantations are planned when the work of planting and fencing against stock can be carried out.

### *Carrying Capacity*

When taken over by the present owner this farm was largely undeveloped, being covered in rushes, with tree stumps in many paddocks. Drainage was badly neglected—in fact almost non-existent. During the past 15 years the farm has been worked hard and continuously and intelligently managed. The table on this page shows the great improvement which has been effected in production and carrying capacity.

The farmer concentrated first on the improvement of the land and stock and now feels justified in constructing a new homestead and buildings. When these are completed the owner will be able to view with pride the results of his 15 years' planning and hard work.

### *Acknowledgments*

Thanks are expressed to the Soil Survey Division of the Department of Scientific and Industrial Research for data in the soil map and to the Lands and Survey Department for the drawing of maps.

All photographs by E. Bruce Levy.

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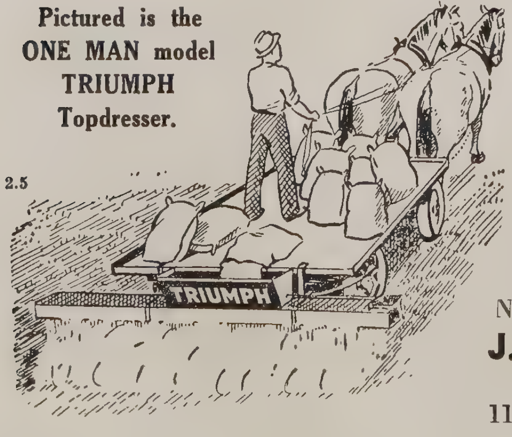

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# Subsurface Broadcasting

## Modification To Drill Coulters

*By* DR. O. H. FRANKEL, *Wheat Research Institute, and* A. G. ELLIOTT, *Crop Experimentalist, Department of Agriculture.*

**THE question of seed distribution in drilling has exercised the minds of agronomists and implement designers since drills were first invented. Obviously, for crops which do not get inter-row cultivation, a method of distributing seeds an equal distance apart would be the most favourable, since this would permit the best chance of development to individual plants.**

DRILLS in commercial use do not and cannot attain this ideal, because rows—for grain sowing—are 7in. apart, and because no drill mechanism has yet been invented which can achieve an equal spread within drill rows. It may be contended that broadcasting would achieve a more even distribution than drilling; but obvious disadvantages of this method are the shallow and uneven depth of sowing.

### *Cross Drilling*

That farmers are aware of the desirability of an even distribution is evident from the fact that some have resorted to drilling half of the seed in one direction and half in another, usually at right angles to the first, thereby achieving a distribution better than is possible in ordinary drilling, at the expense of going twice over the same area. Apart from the distribution of seed, cross-drilling is preferred by some farmers who resort to wind sowing, since the stubble is said to hold up the wind rows better than the stubble of normally drilled crops.

**From consideration of these facts Mr. J. E. Holland, of Avoca Valley, near Christchurch, concluded that the most advantageous seed distributor for many crops would be a device which would permit of broadcasting below, instead of on, the surface.**

Initially he viewed such a sowing method as especially valuable for small seeds—particularly grass seed—on light plains land. Later, Mr. J. W. Hadfield, Director of the Linen Flax Division, drew his attention to the great importance of regular distribution for an even development of linen flax plants. The late Dr. F. W. Hilgendorf, who took a lively interest in Mr. Holland's work, thought that subsurface broadcasting—the term was coined by him—might also be of value for sowing cereals, especially wheat.

### *New Type of Coulter*

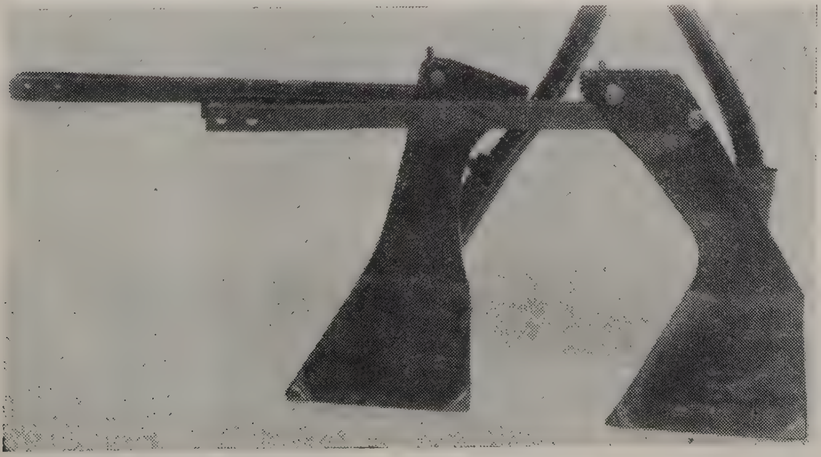
The new type of coulter was originally a combination of an ordinary drill coulter and a broad shoe. The latter provided a cavity about and below the bottom end of the drill coulter. Attached to the coulter was a deflector of shoehorn-like form, convex side up and slanting down and rearward, so that the falling seed and fertiliser impinged upon it and were deflected by it.

This model is now superseded by a complete coulter, designed to give greater distance between front and rear coulter rows to eliminate sledging or soil blockage at the greater depths required for wheat and peas. The designer claims that the new model will give an even better spread than the original one. The original and the new models distribute fertiliser with the seed.

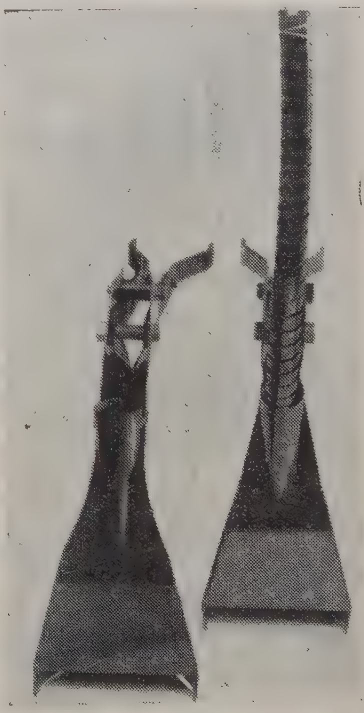
The experiments reported in this article were conducted with the original coulter. The spread, though not always perfect, was sufficiently good to test the principle of subsurface broadcasting in its effect on yield. It is not anticipated that the more recent development in comparison with the older type will materially raise yields.

In the earlier trials, which were conducted with a normal type of drill, there was occasionally a slight tendency to sledging and soil blockage. This tendency was removed in the later trials by a wider spacing between the two coulter rows. This principle which was incorporated in the new design is now a permanent feature.

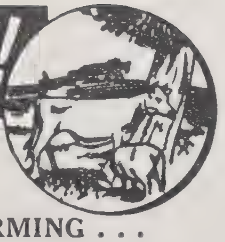
Distribution of seedlings was good, though not perfect. In the early growth stages the centre of each coulter was usually recognisable, the



New type coulter, side view.



New type coulter, rear view.



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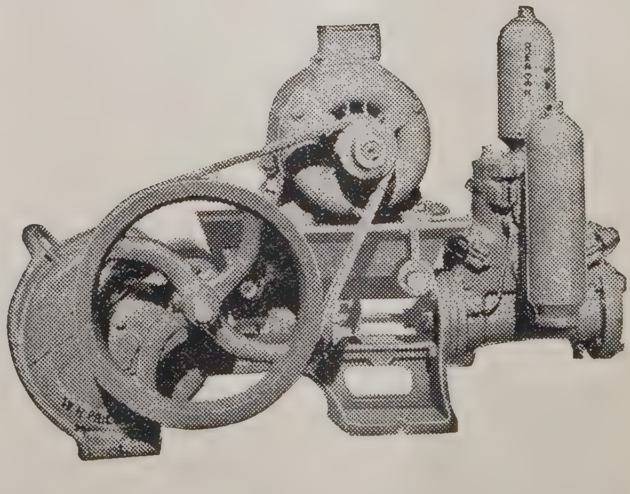

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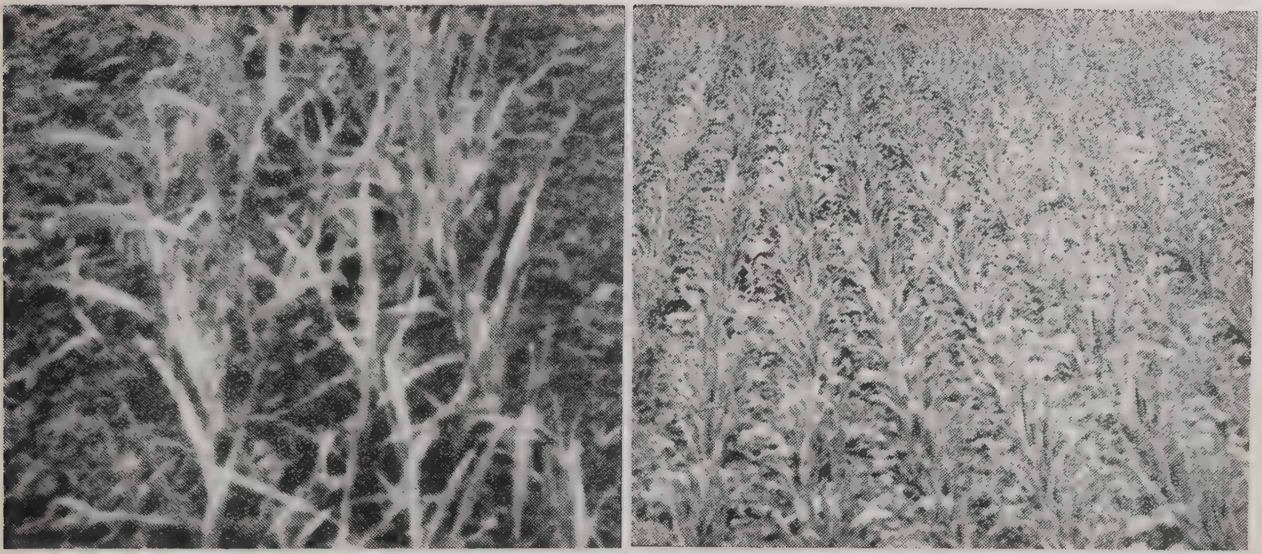

Plant distribution.—Left, new type coulter; right, ordinary coulter.

density of seedlings diminishing with the distance from the centre.

## *Experiments with Wheat*

If the new coulter is to be used for wheat, it must be shown to possess definite advantages. Though not specifically intended for wheat, it was decided to investigate whether wheat yields could be increased by its use. Experiments with the new coulter, tested against the standard type, were made in the 1943-44 and 1944-45 seasons. Since it was not known whether the new type of coulter would be at its best at the standard rate of seeding, or at a different one, some of the trials were laid down in a number of sowing rates, both for the new type and for the normal coulters. Further, a number of varieties were used to give the coulter a general trial. The trials were conducted on three types of soil—a stony silt loam at Oxford, a sandy loam at Templeton, and a silt loam at Lincoln.

## *Trials in 1943-44*

The following yield figures in bushels per acre were secured from the trial at Oxford where sowings of Solid Straw Tuscan with this new type and the ordinary coulters were at the rate of 2 bushels per acre:—

| | |
|---|---|
| **New type coulters .. ..** | **16.3** |
| **Ordinary coulters .. ..** | **17.2** |

Difference in favour of ordinary coulters of 0.9 bushels was not significant.

There was a more even spread of plants on the new type coulter plots, although plants from adjoining coulter sowings did not meet—one-half to two-thirds of each drill width was covered.

In the trial at Templeton, Cross 7 was sown with the new type and the ordinary coulters at rates of 1½ and 2½ bushels per acre. Yields in bushels per acre are shown in the following table:—

| | |
|---|---|
| **New type coulters at 1½ bushels** | **65.3** |
| **Ordinary coulters at 1½ bushels** | **63.5** |

Difference in favour of the new type coulters of 1.8 bushels was not significant.

| | |
|---|---|
| **New type coulters at 2½ bushels** | **77.3** |
| **Ordinary coulters at 2½ bushels** | **68.2** |

Difference in favour of the new type coulters of 9.1 bushels was significant.

Bird damage, which was more severe in this method than in ordinary sowings owing to the more shallow cover, adversely affected early establishment in all plots. At a later stage, the heavier rate of seeding gave a better establishment than did the lighter one on the plots where the seed was sown through the new type coulter.

## *Trials in 1944-45*

At Lincoln, the varieties Hunters and Cross 7 were each sown at rates of 1½, 2, and 2½ bushels per acre with the new type and the ordinary coulters, and results are set out below:

**HUNTERS.**

| **Drill.** | **1½ bus.** | **2 bus.** | **2½ bus.** | **Mean.** |
|---|---|---|---|---|
| **New type ..** | 68.8 | 68.9 | 69.1 | 69.1 |
| **Ordinary ..** | 64.4 | 67.4 | 66.2 | 66.2=1.80* |
| **Mean ..** | 66.6 | 67.8 | 68.6 | |

*Significant difference.

**CROSS 7.**

| | | | | |
|---|---|---|---|---|
| **New type ..** | 62.8 | 60.8 | 62.9 | 62.2 |
| **Ordinary ..** | 61.4 | 65.2 | 62.5 | 62.9 |
| **Mean ..** | 62.2 | 63.0 | 62.7 | |

**Difference not significant.**

It will be seen that with Tuscan at Oxford in 1943-44, the two coulters yielded practically the same. This was also the case with Cross 7 at Templeton with 1½ bushels of seed; but with the heavy rate of 2½ bushels, the new type of coulter gave an increase of 9.1 bushels per acre.

**At Lincoln, in 1944-45, there were no significant differences in a trial with Hunters, at three rates of seeding; yet, in another trial in Cross 7, conducted alongside the first and treated in every way alike, the new type of coulter did markedly well in all three rates of seeding.**

No substantial reason is yet apparent for these inconsistent performances. Yield increases for the new type have occurred on good land, but by no means in every case; they have occurred in Cross 7 and not in other varieties, but even in Cross 7 they have not been apparent every time; they have occurred at some rates of seeding and not at others, but there is no recognisable trend.

## *Moderate Promise*

Summing up these results, the new type of coulter increased yields sometimes, failed to at others, but did not reduce yields in any of the trials. While, therefore, there is moderate promise of increased yields, the circumstances under which these can be expected are complex and unknown.

◆

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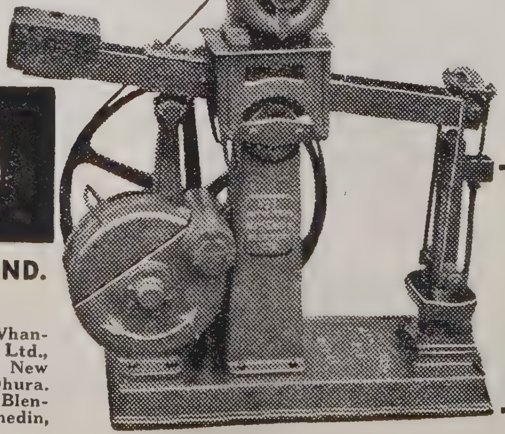

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# PLANNING OPERATIONS ON A MIXED CROPPING FARM

*By* W. V. HADFIELD, *Instructor in Agriculture, Wellington.*

THE science of farming has much in common with the running of a successful business; like the city business man, the farmer has to keep in close touch with market fluctuations and be able to make decisions with foresight and judgment. The planning of a schedule of operations for the coming year, so necessary for the running of a successful business, is by no means easy, for the farmer is frequently confronted with a number of unforeseen circumstances, of which the weather is by no means the least important. In formulating a plan of operations for a mixed cropping farm care must be taken that the programme is not an over-ambitious one, and in excess of the capabilities of both farm and farmer. It is far better to plan a conservative programme and carry it out successfully than to rush crops in with inadequate preparation.

IT is comparatively easy to plan a schedule of operations, but to put it into effect and keep it up to date with so many changing conditions is a greater problem. It is likely to be upset by a number of factors, of which the weather, ravages of insect pests, and fluctuating markets are only a few. Despite the many limitations, it is a decided advantage to plan ahead, and the farmer is indeed wise who gives the subject considerable thought. In this article some of the factors involved, with special reference later to the planning of operations on a specified farm, are discussed. They are as follows:—

1. **Maintenance of soil fertility.**
2. **Pasture maintenance and soil improvement.**
3. **Choice of crops.**
4. **Provision of supplementary sheep feed.**
5. **Planning of an orderly crop rotation.**
6. **Power unit and cultivation work.**

These factors are all closely inter-related and each is very dependent on the other, but an attempt will be made to analyse each in detail.

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The carrying out of a detailed plan of operations is dependent on a number of factors: the condition of pastures may largely govern the amount of cropping, both factors determining the amount of stock to be carried. It may be decided in any one year to plough up a 2- or 3-year-old pasture which has been attacked with grass-grub instead of leaving it to run its course. Again, it may be expedient to plough up a poorly-established pasture and sow down a greenfeed crop. It can readily be seen that there are a large number of factors governing the extent of cropping which may from time to time cause an amendment to the original programme.

If it is decided to save a first-year stand of ryegrass or a second-year stand of clover for a seed crop, due attention must be paid to the grazing management; similarly, greenfeed Italian ryegrass may be regarded as a dual-purpose crop, and provided a good strain of seed is sown, it may be decided after grazing the early spring flush of feed to close up the pasture in October for a seed crop. If a farmer has stocked up to the extent of his pastures, it may not be economical for him to close up the pasture at the expense of his stock. On the other hand, where the saving of grass seed is a normal and reliable undertaking it may pay a farmer to sell his surplus stock in order to close up a pasture for seed production. Under favourable conditions, however, the efficient farmer will use a crop of grass or clover for seed, though it will be dependent on factors such as seasonal growth, class or strain of seed, and quantity of stock carried.

These, briefly, are some of the points which must be considered in relation to the whole before making decisions on problems of general farm management.

### 1. *Maintaining Soil Fertility*

It is the aim of all progressive farmers to increase the production output of their farms, but far too often they lose sight of the fact that soil fertility must be improved or at least maintained before this object can be achieved over a period of years. Extensive cropping or overgrazing may bring increased returns over a limited period, but this soon begins to decline as more and more fertility is removed in the form of grain, meat, and wool. A high carrying capacity or intensive cropping at any particular period is therefore not necessarily the sign of good farming. One has to examine the position of a farm over a period of years to ascertain whether soil fertility has been maintained.

**The first symptoms of overcropping are evident in the form of diminished yields due to an overtaxing of soil nutrients. Lack of tilth is noticeable and is fol-**

**lowed in extreme cases by a gradual breakdown in soil structure. Much of the inherent fertility of the medium to light cropping land in Canterbury was removed at a time when the growing of cereal crops was so profitable, and today the effects of this early exploitation are being widely felt. To bring depleted land back into production a programme of regrassing is necessary, but the building up of fertility is very much slower than its removal.**

In many cases where a farmer is finding difficulty in meeting his financial obligations similar overcropping occurs today. This may have been due at first to faulty management, but to secure ready cash a farmer is frequently forced into excessive cropping, which often leads not only to excessive cropping of individual paddocks but also to the removal of more and more pasture for cropping. The resultant loss of fertility causes lower yields, and more pasture is ploughed up for wheat, until the balance of pasture to cropping land is completely upset. This problem is undoubtedly one of farm management and the solution is twofold:—

(a) By maintaining an orderly rotation, with systematic cropping and controlled grazing, higher individual yields and higher carrying capacity can be expected.

(b) By keeping a correct balance between pasture and cropping land overcropping can be prevented.

The immediate returns may be slow, but over a period of years the farmer will find himself not only in a better financial position, but he will also have maintained his soil fertility at a higher level. In this way reduced cropping with higher individual yields will have taken the place of extensive low-yielding crops and depleted soil fertility.

In mapping out a plan of operations the farmer must take into account the maintenance and improvement of soil fertility. Repeated cropping of paddocks should give way to systematic cropping, allowing for the regrassing of cropped paddocks every few years.

## *2. Pasture Maintenance and Soil Improvement*

The importance of pasture land on a mixed cropping farm cannot be overemphasised. It is a necessity in the production of meat and wool, but it has also a far-reaching effect in building up soil fertility. The effect of clovers in providing nitrogen to the soil, together with the accumulation of stock excreta, assists in maintaining fertility, while the turf helps in building up tilth and providing nutrients to the soil. This, in conjunction with an adequate topdressing programme and controlled grazing to get the best out of pastures, will eventually improve the fertility of the soil. After one or two cereal and fodder crops have been removed from a paddock it is necessary to grass it down to renew the fertility which has been removed. As the pasture in time becomes "run out," a crop or two may be taken before sowing down into permanent pasture. In this way crops can be taken, yet fertility maintained.

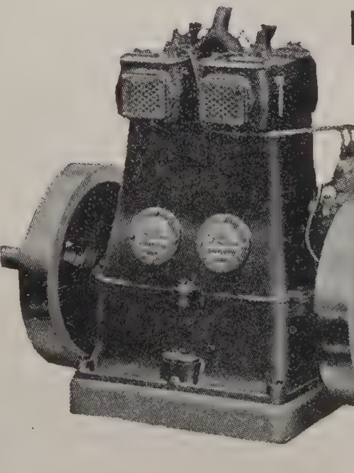
The quality of pastures also bears a definite relation to soil fertility, because a high-producing pasture is capable of carrying greater stock numbers and fertility in the form of stock excreta is returned to the soil. Through its supply of nitrogen and humus a good pasture will build up soil fertility quite appreciably. For these reasons the wise farmer will include in his seed mixtures Government Certified ryegrass and clover. This has been the practice on a large proportion of the cropping farms of Canterbury, mainly because of the high price obtained for Government certified grasses and clover seeds. Under favourable conditions it pays the farmer to shut up one or two of these pastures for the purpose of seed production. Even the secondary effect which these high-producing pastures have in building up the general level of soil fertility is a consideration. A practice frequently adopted by farmers on cropping land where conditions permit is to plough up pastures before they have completely "run out" and sow down with a grain crop. This "cashing-in" of fertility adds appreciably to the benefit of succeeding crops.

**It can be seen that in planning ahead on the farm pasture maintenance and improvement are closely related to soil fertility, and crop rotations must be arranged to enable "run-out" pastures to be ploughed up in rotation and cropped paddocks to be sown down in pasture before soil fertility begins to show a decline. On a mixed cropping farm, where pastures last, say, from 4 to 5 years, it is necessary to sow down from 40 to 50 acres of new grass each year to maintain a yearly total of 200 acres of pasture.**

## *3. Choice of Crops*

The farmer has a fairly wide range in the choice of crops. The selection, however, is dependent to a large extent on soil type and climatic conditions. In most cases wheat is undoubtedly the main crop. It does not always pay a farmer to have "all his eggs in one basket," for not only does it entail a heavy pressure of work over a limited harvest period, but it does not allow for the spreading of any risk at harvest time. For this reason many farmers grow at least one or two other "cash crops" which may be classified as follows:—

1. Basic farm crops: Wheat, milling oats, field peas.



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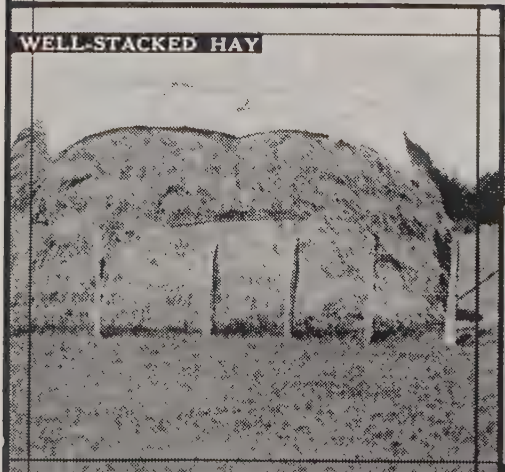

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2. Supplementary farm crops: Potatoes, linen flax, garden peas, barley; root crops for seed.
3. Small seed crops: Grass and clover saved for seed.

**Wheat should be the first consideration in planning a cropping programme. It has been, and still is, the main crop, although in some districts during the war linen flax has proved an important competitor. Where soil conditions are favourable peas, potatoes, and barley are widely grown, and on the class of country suited to this type of production they may be classified as basic farm crops. Supplementary farm crops, particularly cruciferous seed crops, may be a risky venture, but if conditions are favourable, they may provide a useful contribution to the income.**

When laying down pastures the wise farmer will sow good strains of certified grasses and clovers in his seed mixtures, and if conditions are favourable he will save a first-year stand of ryegrass or a second-year stand of clover for a seed crop.

If in any one year a farmer finds himself "pinched" for stock feed and wishes to save grass or clover seed, he is faced with the problem of either retaining his stock and grazing these pastures or of selling some of his sheep and using the selected paddocks for seed. His decision will be based first on the prospects of a reasonable season and a ready market, and second on the ruling prices for the class of stock he may be forced to sell. Where stock prices are low and prospects of securing a heavy crop of seed are not favourable, it would be advisable to retain the stock and graze the paddocks. On those farms where the sowing of grass and clover seed is an annual practice the farmer takes into consideration the fact that certain of his pastures will be closed from grazing from October to February and his land is stocked accordingly. This avoids the necessity of selling at a time when it may not even be economical to sell surplus stock.

In selecting crops to be grown the farmer has to take into account not only the above considerations, but also any likely trends in the market, as this may be the ultimate factor affecting his final decision.

## *4. Supplementary Sheep Feed*

Adequate provision of supplementary sheep feed is an absolute necessity on a mixed cropping farm, and in all cases the farmer should carry ample reserves of dry feed to meet any contingency.

Sheep should be more than a mere sideline to the cropping man; they are a necessary part of his programme, and to get the best out of his stock the farmer must plan ahead to ensure an adequate feed supply.

On a mixed cropping farm it is the usual practice to save lucerne or good meadow hay in sufficient quantity to allow for extra feeding should a severe winter eventuate, and on the lighter Canterbury land oats may be grown for chaff. Rape is generally grown for lamb fattening and Italian ryegrass for early spring feed.

## *5. Planning Orderly Rotation*

When putting a crop rotation plan into effect a number of unforeseen factors frequently assert themselves and revision may be necessary; wet weather may interfere with the sowing of wheat and necessitate the growing of some other crop in the spring, or it may so hinder cultivation that it is impossible to plough the ground sufficiently early. Grass-grub may so infest a pasture that it may have to be ploughed up in the second or third year. Such factors may upset the planned rotation and entail an alteration of the original programme. Nevertheless every effort should be made to observe a crop and pasture rotation which enables a farmer to look ahead and visualise the position of his farm a few years hence.

**The principle of a crop rotation is the renewal of depleted pasture land by cropping the ground before regrassing and observing an orderly sequence of crops to maintain fertility and avoid overcropping.**

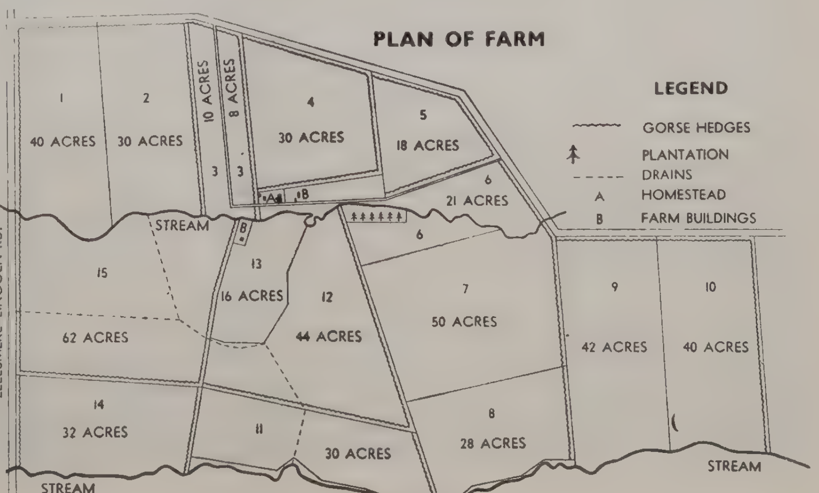
The nature of a particular rotation depends in the first instance on soil type and climatic conditions, though the general principle applies in all cases. The ideal is to place crops in the rotation so that maximum benefit is obtained from the preceding crop. It is therefore usual to avoid growing cereal crops in succession, and where possible it is an accepted practice to separate cereal crops with a fodder crop, for example, old pasture — peas — wheat — rape — wheat — new grass. In this rotation the first wheat crop receives the benefit of any nitrogen from the preceding crop of peas. Similarly the second crop of wheat should receive benefit from the feeding off of the rape crop before the ground is again sown in grass seed. Care must be taken in all cases, however, to preserve the economic balance between area in pasture and area in crop. In the common practice of ploughing up pastures before they have "run out" the first crop after grass receives the benefit of the extra fertility present.

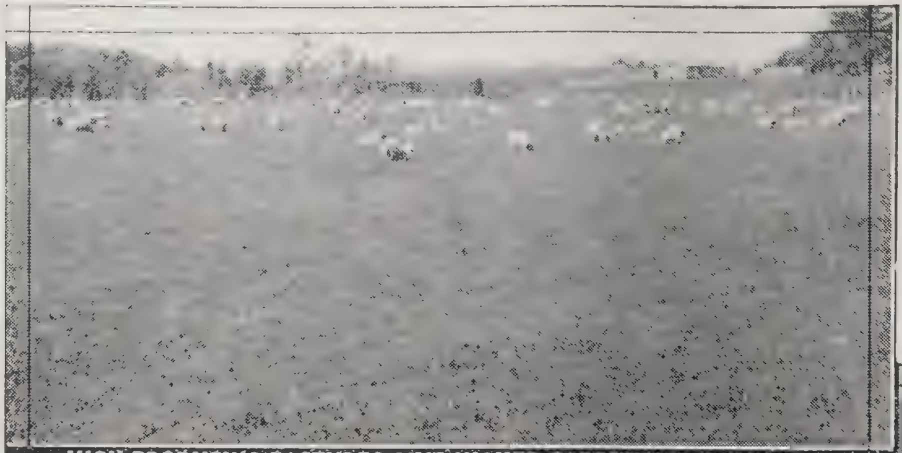
Care should be taken in planning a crop rotation to ensure that ample time is allowed for cultivation. Early cultivation and use of the "fallow" are two methods of maintaining fertility.

### MIXED CROPPING FARM.

The following description of a Canterbury mixed cropping farm is intended as a preliminary to the study of the general plan of operations and the system of rotational cropping practised. The farm cannot be regarded as a typical Canterbury farm, but the cropping practices adopted may be described as typical of those on heavy land in Ellesmere and part of the Springs County. As will be emphasised later, a fairly standard programme has been observed over a period of years and a relatively fixed cropping rotation adopted.

The farm, of 513 acres, is included in the Springs County and is situated 3½ miles from Springston. The soil is a heavy loam 6in. to 10in. in depth overlying clay, and its high natural fertility produces heavy yields of grain and seed. Portions of the farm are swampy, and some of the paddocks on these areas have not been ploughed to the knowledge of the present owner.

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LIMING AND TOPDRESSING ARE NECESSARY

A WELL-BALANCED PASTURE

809
160
MACHINE
RYEGRASS
DRESSED
USE CERTIFIED SEED

## *Type of Production*

Annual cash crops normally grown are barley, peas, and wheat, averaging 92 acres a year. In addition from 100 to 120 acres of pasture are closed up annually for harvesting ryegrass and clover seed.

Stock consists of 500 breeding ewes, usually ¾-breds, from which 75 per cent. of the lambs are sent away fat, the remainder being fattened on rape and on crop stubble; 200 to 300 4-year-old sheep are bought in annually for replacements and two seasons' lambs are produced. Breeding ewes are all put to Southdown rams. In addition 1,000 to 1,500 store lambs are usually bought and fattened on rape and stubble. Between 30 and 45 Black Poll-Hereford cross cattle are carried. Calves are reared, fattened, and sold as 2-year-olds from July to October; this procedure depends on the feed position, and in some years it is necessary to sell them as stores. Extra cattle feed consists of good meadow hay saved from the pastures. Supplementary stock feed consists in the main of

20 acres hay for sheep and cattle feed,

12 to 18 acres turnips for sheep feed,

20 to 30 acres Italian ryegrass for spring feed,

2 to 3 acres chou moellier and mangolds for cattle and sheep feed, and

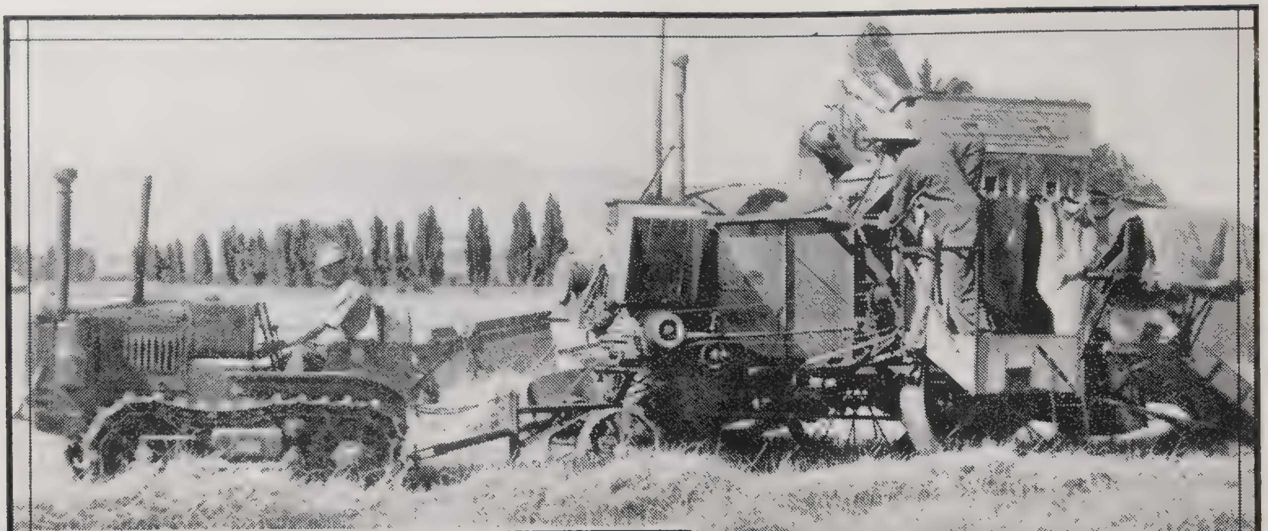
Stubble ground left from peas, wheat, and barley.

## *Pastures*

The life of pastures on this land is from 7 to 8 years, though some pastures have been down considerably longer. This necessitates the sowing down of 40 to 50 acres of permanent pasture each year. Sown pastures consist mainly of perennial ryegrass, white clover, and red clover, and in most cases the owner has sown down seed from his own pastures, which in all cases was Government Certified seed. The usual method of sowing down pastures is with a rape crop from November to December, the rape being sown at the rate of 2½ to 3lb. per acre through every other coulter of the drill. Experience has shown that better pastures have been obtained by this method of sowing down, the reason probably being the extra consolidation obtained by stocking the area. The owner emphasises that where grass seed is sown with rape in this manner the production of a good pasture is the main consideration. By maintaining a fairly heavy liming programme the life of pastures is extended, though attacks of grass-grub (*Porina*),

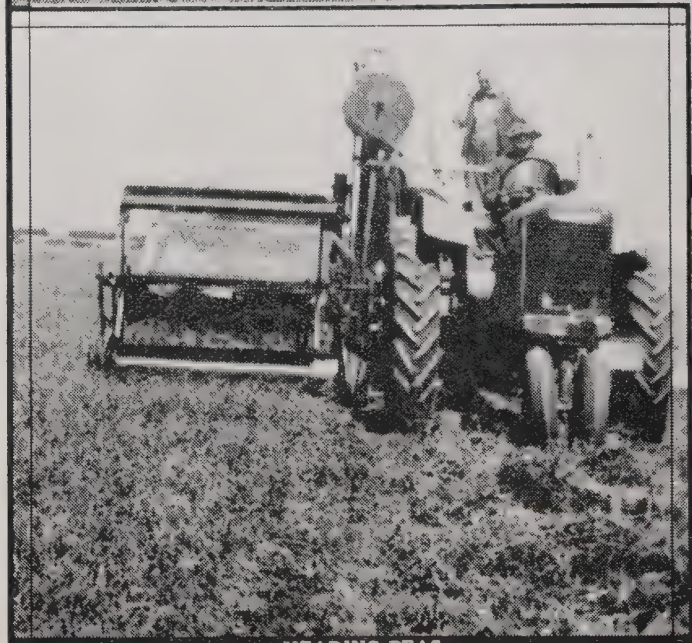
# PREPARATIONS FOR CROPPING

Early cultivation and a well-prepared seed-bed are necessary. Upper—Skim ploughing. Middle—Deep ploughing. Lower—Well-prepared seed-bed.



HEADING BARLEY FROM WINDROW

*THE HEADER HARVESTER IS USED FOR HARVESTING MOST GRAIN CROPS*



HEADING PEAS

DIRECT HEADING WHEAT

which have been very severe on some of the pastures, have in some cases necessitated the ploughing up of young pastures before many years.

### Power Unit and Cultivation

The power unit is a wheeled tractor on rubber and there is a 6-horse team. Where paddocks are too heavy or wet for tractor ploughing the team is frequently used. Cultivation equipment consists of a 3-furrow mouldboard plough, tandem discs, 2 cultivators, 3 sets harrows, a roller, and a drill; there are also 2 binders for windrowing crops, a mower and side-delivery rake, a broadcaster, and a limesower.

Preparation of ground for peas usually consists of deep ploughing the turf paddock in June or July to a depth of 6 to 7in. and leaving it in the furrow. It is then disced, harrowed, rolled, and again double-disced if necessary. A final grubbing, provided the turf has rotted, and a harrowing are sufficient to leave the paddock in good order for sowing Greenfeast garden peas in late September. If necessary the paddock is rolled before peas are through the ground to break up clods, and the crop is usually harrowed after the peas are through to suppress weed growth.

Wheat usually follows peas in the rotation, and the pea stubble is skim ploughed early and then deep ploughed. Several strokes of the heavy harrows usually leave the ground in a fit state for drilling wheat in April or May. The Dreadnought variety is preferred, as it yields a heavy crop of good-quality wheat on this country. When the ground has become caked after hot weather following a wet spell about the time of sowing, the crop is often disced with only a slight cut applied to the discs, followed by a harrowing. This apparently drastic treatment is practised to good advantage in this district.

Barley ground is usually prepared after wheat and is skim ploughed, followed by a deep ploughing in June, and then left to lie until the spring, when it is disced, grubbed, harrowed, and left until the ground is warm before sowing. Drilling may be carried out from September to November, though a risk may be taken with the later sowing if there is a dry spell. The ground may be rolled after the barley is up, though excessive harrowing should be avoided. Spratt-Archer is the variety usually grown, though Golden Archer, a comparatively new variety, is to be grown this season.

### Harvesting of Crops

Dreadnought wheat is cut with the reaper and binder, stooked, and stook threshed with the mill. Similarly, barley is cut with the binder and stook threshed with the wooden mill. Peas are usually cut with the mower and threshed from the windrow using the pick-up header.

Small seed crops are usually windrowed and threshed with the pick-up header. The crop is cut with an 8ft. binder operating without the binding attachment and discharging the loose crop over the platform canvas into windrows. This binder is followed by a similar 6ft. binder which discharges the crop over the elevator canvas only. This has the effect of leaving one wide windrow from both binders, and the crop is eventually threshed with the pick-up header. Italian ryegrass, however, is cut with the reaper and binder and stook threshed with the header harvester, the stooks being carted into the stationary header.

Wheat yields average approximately 45 bushels per acre, though as high as 75 bushels has been obtained. Barley and pea yields average 55 bushels and 20 bushels respectively, while 60 bushels of Italian ryegrass per acre off the mill has been obtained.

### Labour

The owner has been forced to modify his programme to some extent and neglect certain maintenance items in order to fit in with the reduced labour available during the war, and fencing and general repair and maintenance work have suffered. Three sons were working on the farm before the war, but during the war the work has been done by a married man and a boy and whatever casual seasonal labour was available.

### Programme Modifications

On a farm like this it is difficult to put a prearranged programme into effect. Excessive rain on this heavy land frequently holds up cultivation to such an extent that it is necessary to alter or modify some of the plans. With an abnormally wet autumn and winter during 1945 it was not possible to sow the acreage of wheat intended and the wheat ground was left over for an increased area of barley in the spring. Similarly it was not possible to harvest the bulk of the small seed crops, which were cut and left in windrows and so damaged by wet weather that they were eventually stacked for hay, on which extra stock bought in were wintered.

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## TABLE I—FARM CROPPING ROTATION FROM 1942-43 TO 1945-46.

| Paddock No. | Area in Acres. | 1942-43. | 1943-44. | 1944-45. | 1945-46. | Remarks. |
|---|---|---|---|---|---|---|
| 1 | 40 | Old pasture | 18 turnips<br>22 old pasture | 15 barley<br>15 rape<br>10 wheat | 25 barley<br>15 wheat | |
| 2 | 30 | 15 peas<br>10 oats<br>5 old pasture | 30 wheat | 20 Italian rye & M. red clover<br>10 oats | 20 Italian rye & Mont.<br>10 Italian & Mont. | (1 yr.)<br>(new) |
| 3 | 18 | Old pasture | 18 potatoes | 13 wheat<br>5 barley | 18 barley | |
| 4 | 30 | Old pasture | 30 Italian rye & M. red clover | 30 Italian & M. (1 yr.) | *30 (10 barley, 10 lucerne, 10 peas) | *Not yet sown. |
| 5 | 18 | Old pasture | 18 old pasture | 18 old pasture | 18 old pasture | 9-10-yr. old. Due for reploughing. |
| 6 | 21 | Old pasture | 21 old pasture | 21 old pasture | 21 old pasture | Has not been ploughed. |
| 7 | 50 | Grass pasture | 50 grass pasture | 50 grass pasture | 25 old pasture<br>25 new grass | |
| 8 | 28 | Barley (after grass) | 28 wheat | 28 rape, turnips, and grass | 28 grass pasture | |
| 9 | 42 | Rape & grass | 42 grass pasture | 42 grass pasture | 42 grass pasture | |
| 10 | 40 | Wheat (after peas) | 32 rape & grass<br>8 oats & grass | 40 grass pasture | 40 grass pasture | |
| 11 | 30 | Old pasture | 30 old pasture | 30 old pasture | 30 old pasture | |
| 12 | 44 | Old pasture | 22 peas<br>22 barley | 30 wheat<br>14 peas | 20 Italian rye & white clover<br>18 oats<br>*6 rape | *Not yet sown. |
| 13 | 16 | Old pasture | 16 old pasture | 16 old pasture | 16 old pasture | 9-10 year old. |
| 14 | 32 | 12 turnips and grass<br>20 new grass | 32 grass pasture | 32 grass pasture | 32 grass pasture | |
| 15 | 62 | Grass pasture | 62 grass pasture | 62 grass pasture | 42 grass pasture<br>*20 peas | *Not yet sown. |
| | 501 ac. | | | | | |

The two main rotations most favoured by this farmer are as follows:—

1. Old pasture — peas — wheat — barley — rape and grass seed.
2. Old pasture — rape — wheat — barley, and sown down with grass.

In many cases circumstances have necessitated the adoption of varying rotations, some of which are as follows:—

1. Old pasture — barley — wheat — rape and grass seed, or turnips and grass seed.
2. Old pasture — peas — wheat — Italian ryegrass and Montgomery red clover.
3. Old pasture — turnips — barley — wheat — rape and grass seed.

## TABLE II—FARM PROGRAMME FROM 1942-43 TO 1945-46.

| Crop. | 1942-43. | 1943-44. | 1944-45. | 1945-46. | Average. | |
|---|---|---|---|---|---|---|
| | acs. | acs. | acs. | acs. | acs. | |
| Grass pasture .. .. .. | 334 | 293 | 311 | 294 | 308 | |
| New grass pasture .. .. | 74 | 40 | 28 | 25 | 42 | |
| Temporary grass pasture (1 year) .. .. .. | | | 30 | 20 | 12 | |
| Temporary grass pasture (new) .. .. .. | | 30 | 20 | 30 | 20 | |
| Total grass .. .. | 408 | 363 | 389 | 369 | | 382 acs. |
| Wheat .. .. .. | 40 | 58 | 53 | 15 | 42 | |
| Barley .. .. .. | 28 | 22 | 20 | 43<br>10* | 30 | |
| Peas .. .. .. .. | 15 | 22 | 14 | 30* | 20 | |
| Oats .. .. .. .. | 10 | 8 | 10 | 18 | 12 | |
| Rape .. .. .. | 42‡ | 32‡ | 15‡<br>28§ | 6*<br>12* | 34‡ | |
| Turnips .. .. .. | 12 | 18 | 28§ | | 15 | |
| Lucerne .. .. .. | | | | 10* | | |
| Potatoes .. .. .. | | 18 | | | | |
| Chou moellier .. .. | 1 | 1 | 1 | 1* | 1 | |
| Mangolds .. .. .. | 1 | 1 | 1 | 1* | 1 | 155 |
| | 557 | 543 | 557 | 515 | | 537 acs. |

‡ New grass sown down with rape. Acreages included also in column "New grass."

§ Turnips sown with rape and grass. Acreage included also in column "Rape."

* Areas not yet sown.

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## Rotations and Farm Programme

The crop rotational practices adopted in relation to the maintenance of a cropping programme on this farm are illustrated on the opposite page. Table I sets out the cropping rotation for each of the paddocks for the four years 1942-43 to 1945-46.

A further analysis of Table I makes it possible in Table II to set out the programme operated over the four years, and also to show the correlation between the cropping rotation and cropping programme.

Duplications have occurred in Table II where two or more crops have been sown together yet tabulated separately in the table, as with rape and grass. For this reason the total acreage for each year will be greater than the actual area.

It is apparent that a fairly consistent programme has been in operation over the four years, and in no instance has there been a marked divergence from the average. Where conditions have demanded it modifications of the programme have been made.

The average of 382 acres annually in grass pasture represents 71 per cent. of the farm, the remainder being in grain crop, sheep feed, or lying fallow. This balance in favour of pasture may seem high, but approximately a third of the pastures are closed up annually for the saving of grass and clover seeds. On medium to light Canterbury land, where seed saving may not be carried out to the same extent, one might expect to find approximately 50 per cent. of the farm in grass pasture and a proportionately larger area in grain and feed crops.

**The maintenance of the consistent programme evident in the management of this farm would indicate that a reasonable balance of cropping to pasture has been reached. It should be the aim of all farmers, once an economic balance has been reached, to give careful consideration to the farm management aspect, in an endeavour to maintain this balance.**

## 6. Power Unit and Cultivation

In deciding the nature of the cropping programme it must be remembered that the extent of the programme is governed by the available power unit.

On a mixed cropping farm, with approximately 200 acres yearly under cultivation, a 25-30 h.p. unit (or two 6-horse teams) would be necessary to cope with 1,000 hours of work, calculated on a basis of five hours' tractor work per acre. In many cases, however, farmers have found it economical to use two tractors, one for the heavier work and a lighter one for topworking and seed-bed preparation. During the harvesting season, when one of the tractors is in use almost continually on harvesting work, the other is available for cultivation. It is a decided advantage to keep cultivation work up to date at harvesting time when it is often difficult, for example, to get wheat ground topworked prior to deep ploughing.

In planning his programme for the following year the farmer has to consider the distribution of his power unit throughout the year. If his programme is beyond the capabilities of the available power unit, or, if in order to carry out a heavy programme, the farmer is forced into ploughing with an inadequate fallow, he must either increase his power unit by employing contract work, or amend his programme to something a little less ambitious.

On this particular farm the cultivation of the average of 183 acres yearly requires the employment of the six-horse team and the tractor. Although the area under cultivation is short of the 200 acres mentioned previously, the extra cultivation necessary to work the heavy soil increases the team and tractor work to approximately 1,000 hours yearly.

A number of factors may interfere with the carrying out of a cultivation time-table, and there is often a last-minute rush to prepare the seed-bed for the new crop. This can be avoided to a great extent by endeavouring to commence cultivation work as soon as the previous crop is finished, so that a fair margin of time is allowed should a tractor break down or wet weather hold up the work.

## Conclusion

**It may be argued that it is impracticable to run a farm to a schedule, and this may be so if, for instance, a wet season prolongs harvesting work or a wet autumn upsets the planning of cultivation work. If, however, the farmer fully appreciates the factors involved in planning a programme, and endeavours to put a workable plan into effect, he will find himself the centre of a planned organisation which should enable him, as conditions warrant, to modify his programme and overcome setbacks far more easily than the haphazard farmer who gives little thought to organisation.**

Farm planning should result in a steady level of production and a general maintenance of soil fertility, which in turn will be reflected in the balance sheet; but it will do so not at the expense of the farm.

---

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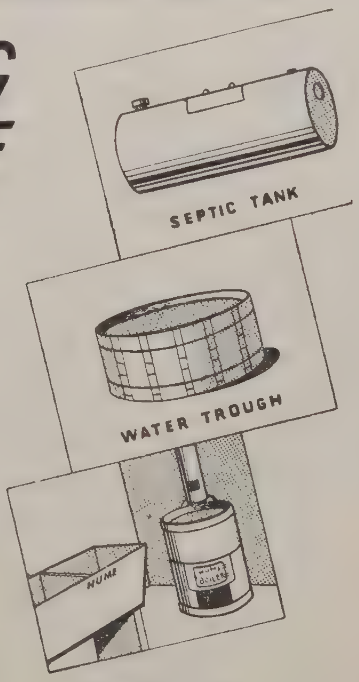

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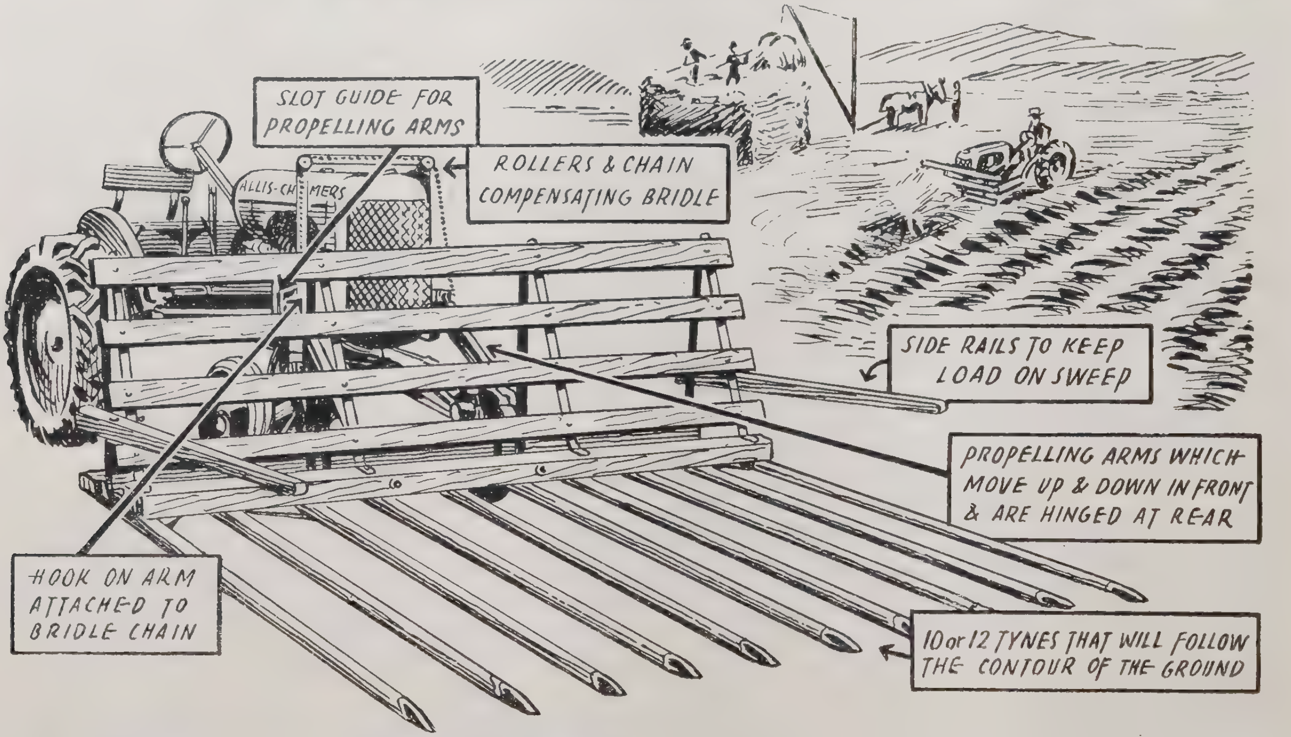
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# Packing Shed Efficiency

## Orchardists and Staff Supervision

*By* A. R. GRAINGER, *Orchard Instructor, Christchurch.*

THE orchard owner or shed foreman, besides being responsible for the efficient management of the packing shed staff, should also see that the work of both graders and packers, as well as general hands, is up to standard. He should frequently check the grading, packing, nailing down, and labelling.

AS the colour requirement and russet allowance vary according to the variety, a card giving the main details of the grade requirements for the variety being handled should be set up on the grading table where the hands can see it.

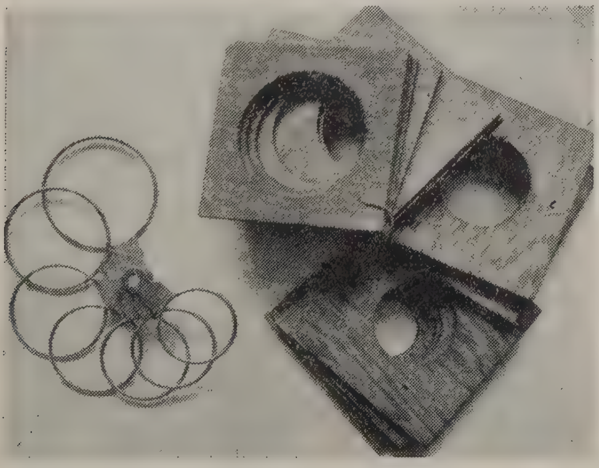
**Example: DELICIOUS.**

| | Fancy. | Commercial. | Minimum. |
|---|---|---|---|
| Colour (not less than) .. .. .. | 15% | Colour showing | N.C. |
| Blemish (not exceeding) .. .. | 3% | 10% | 15% |
| Smooth Russet (not exceeding) .. | 15% | 100% | 100% |
| Solid Russet (not exceeding) .. .. | Nil | 30% | |

During February only Gravenstein, Cox's Orange, and a few other early varieties are being handled, and in most orchards a full staff is not required and staff organisation is not fully effective until towards the end of the month or the beginning of March.

### *Sizing the Fruit*

To pack fruit properly it must be sorted into sizes as near the same diameter as possible. When very small lots are being handled, sorting may be done by hand with an occasional check-up with size rings (see illustration). The metal ones are more compact, but three-ply ones of any size can be obtained readily. However, it is advisable to use a mechanical sizer for the crop of most commercial orchards. These machines size either by the diameter of the fruit or by its weight. The former are quite satisfactory for handling varieties which are fairly round and even in shape, such as Jonathan, Ballarat, and Granny Smith, but are not so accurate when they are used on flat apples or on pears unless the machine is one using a belt on which each apple is placed on its cheek. The machine which sizes by weight will handle all shapes of fruit most satisfactorily. An imported make originally set the standard in this respect, but sizing machines manufactured in the Dominion are now available and do satisfactory work.


Metal and plywood size rings.

Picking apples into a good type of bag.
[*Internal Affairs Dept. photo.*

Sizing machines are almost invariably combined with sorting tables, on which the fruit is separated into the various grades, and the whole is called a grader, which may be of one, two, three, or four sections, according to the number of grades it is desired to handle at one time. At present two sections are sufficient for the average commercial orchard to grade into Fancy and Commercial. Large packing sheds can do with three-section machines, and, should export of fruit be re-introduced, when three grades may be required—Extra Fancy, Fancy, and Commercial—even individual orchards with large output may require a three-section grader.

Some grading machines are made with eight bins only to each section, which often necessitates the packing of two separate sizes out of one or two bins on an average run of fruit. Ten bins per section are preferable.

**Before harvesting begins each season all parts of mechanical graders should be thoroughly cleaned and working parts oiled and checked over for weak or badly-worn portions, which should be replaced immediately, or at least a spare part procured. Good lighting should be provided over the grading table.**

### *Packing*

The following are a few points on packing which should be kept in mind.

1. The packing stand should be at a height to suit the packer. When standing erect and extending the arms straight down into the case the tips of the fingers should just touch the bottom of the box.
2. Try to build the bulge on the pack by allowing a smaller pocket between the apples in the middle of the layer. This can often be achieved by the packer gently

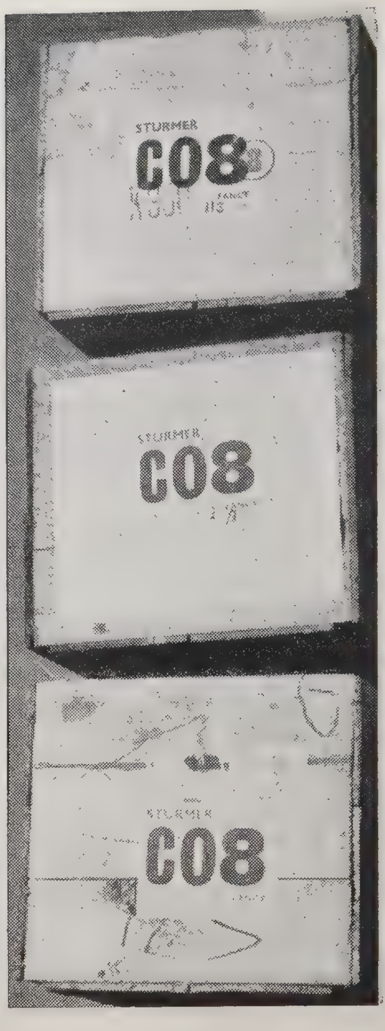
pulling the fruit of the first layer towards him when three-quarters of it has been placed in position. This bunches the fruit more in the centre, and the second and subsequent layers go down more at the ends because of the larger pockets there. This is difficult to carry out with the highest counts of each style of pack.

3. Place each layer firmly into the pockets of the one below it.

4. When ready for nailing down the top of the pack should be higher in the centre (about 1½in. above side board for export pack) but the end apples must be almost level with the end boards. Much bruising occurs in nailing down if this point is not watched.

### *Labelling*

To conserve timber supplies second-hand cases should be used for packing, provided they are clean, sound, and free from old brands. The illustration shows at bottom a case in need of the removal of old brands, in the centre one method of doing this, and at the top a neat method of labelling and branding so that the case will require a minimum of renovation for use again.



**Second-hand cases. Top—A neat method of labelling and branding ensuring minimum of renovation for re-use. Middle—One method of removing old brands. Lower—Old brands should have been removed.**

### *Small Fruits*

**Raspberries:** By February the main crops of raspberries will have been harvested, but Lloyd George and similar varieties will continue to produce some fruit until the autumn from blossoms on the current season's wood. An application of Bordeaux 3-4-50 should be made this month where cane wilt disease is known to be present in the district, and combined with this, or alone if Bordeaux is not necessary, an application of arsenate of lead powder 1½lb. to 100 gallons of water is generally essential for control of bud moth caterpillar.

**Passion Fruit:** Brown spot (*Alternaria passiflorae*) may be in evidence at this time of the year. Application of Bordeaux 3-4-50 will assist control. If vines whose foliage has become very dense are lightly pruned spraying will be more effective. Normally, however, this thinning should have been done in the spring.

◆

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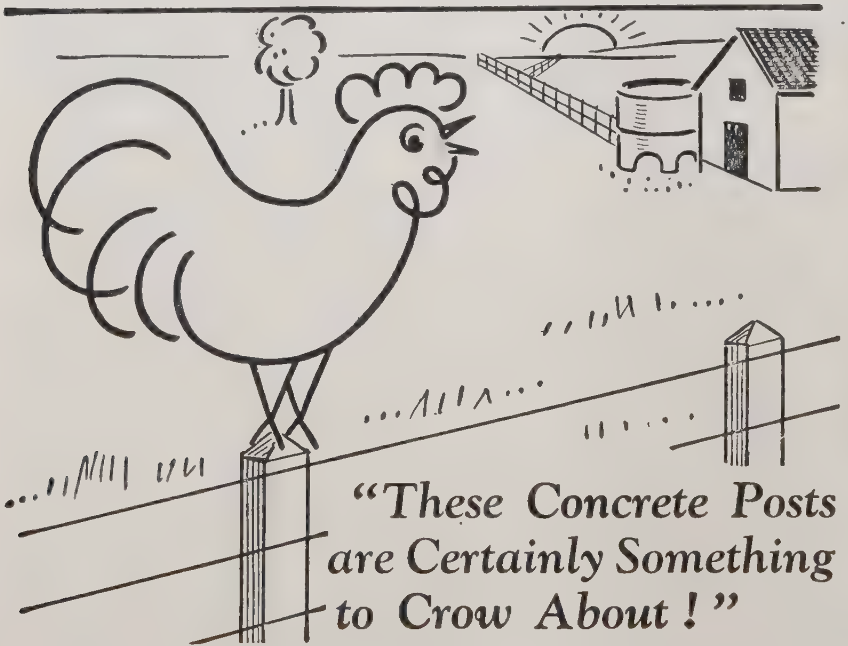
Bulletin No. 135, "Passion Fruit Culture," is now available **free** from the Department of Agriculture, Wellington.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# HARVESTING LINEN FLAX

## Improvements In Handling

*By* L. EARL,
*Fields Instructor, Timaru.*

LINEN flax production has been a factor in the agricultural and industrial economy of certain South Island districts, especially South Canterbury, in recent years. Because of indifferent weather, pulling machinery prone to maladjustment, and a shortage of experienced operators, production of the crop in the field, particularly from the harvesting aspect, has not been straightforward. Moreover, measures taken to get the crop pulled, stooked and stacked in the shortest possible time have caused much to be roughly handled. These and other difficulties which this industry has had to combat are discussed in this article.

MUCH of the potential yield was lost through crops being roughly handled and despite the subsequent exacting handling in the mill, yield and grade remained much below the production estimated from the standing crop.

### *Bad Season*

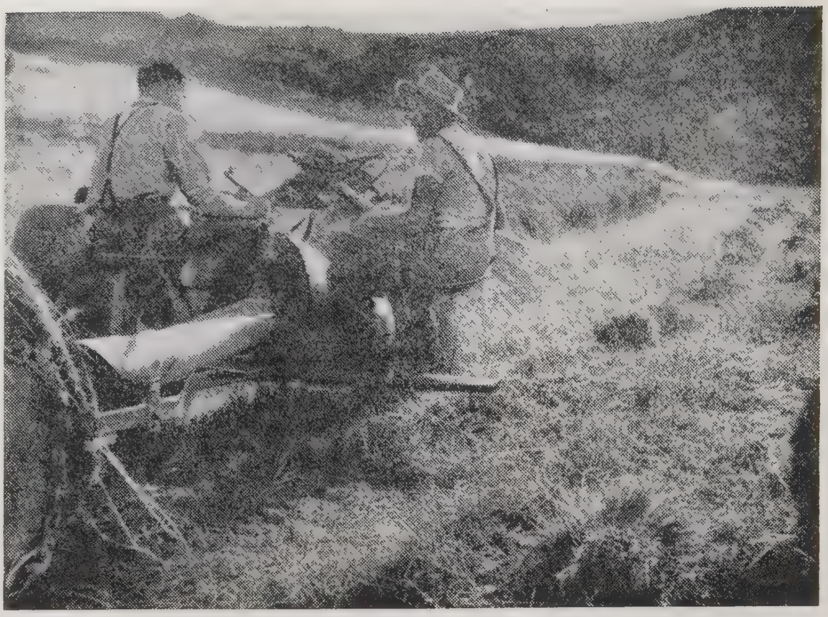
The 1944-45 season was particularly bad at harvest time. Showery weather began in mid-January and continued throughout the harvest. A major flood late in February completely stopped operations and seriously affected much of the crop already stooked. Before this, however, the weather had caused severe deterioration in crops already pulled, and it became abundantly clear that unless some attempt were made to prevent further deterioration there was a distinct likelihood of harvesting and delivering to the mills flax of a very inferior quality. The flood forced the issue. It prompted a method of harvesting which enabled flax to be delivered into stack or mill varying little in quality and colour from the standing crop. This minimised the effects of the weather, always an uncontrollable factor in flax production.

The end of the war means that the industry faces the prospect of fibre production on a peacetime basis with fibre selling at competitive prices and with quality and grade the deciding factors. Flax fibre may have to be sold at considerably lower prices than those ruling during the past few years.

**To meet these changed conditions greater efficiency in handling the raw material will have to be achieved, and a greater net quantity of line fibre produced for every ton of raw flax.**

Reasons for the measures adopted to control the harvesting of the crop and so produce the maximum quality in the fibre are therefore apparent.

Last season an experimental system of harvesting, known as "barting," was adopted at Fairlie. This does away with the necessity for stooking and stacking the crop and can be operated as soon as the flax is stiff enough to stand—usually one to two days after pulling. The crop is then protected securely from the weather.



**View of puller from tractor showing position of puller operator in front of machine and straightener at side. Note power take-off guard and sheaves lying straightened.**

## *Pulling the Crop*

It has always been recognised that a linen flax crop is never more attractive than when standing in the paddock ready to pull. The straw is undamaged and of approximately even length. However, it was found that as soon as the puller had tied this into a sheaf, delivered it through the binder and expelled it on to the ground, the fibre had lost most of its value in a few seconds, through bruising and general twisting and damage incurred in this operation.

For this reason the first problem to be tackled was that of improving the pulling technique so that the sheaf coming off the puller was straight and as evenly butted as possible, that the straw was undamaged, and that each sheaf was separated from the next, and not one of three or four dragged along until separated from the machine by sheer weight of the preceding sheaves which had not been separated from each other. It was clearly seen that the flax pulling machine at present in use is very limited in the quality of work it performs. As with most agricultural machinery, the effectiveness of its performance rests with the operator.

**A flax puller in the hands of a careless operator, while often a danger to himself and others, is ruination to flax straw.**

It was found that the only satisfactory way to straighten the sheaf was to do it manually in either of two ways.

**(a) On the machine:**

By attaching a seat to the puller at the end of the table the man straightening the sheaf received it in his lap, pulled the "fanned" ends of the sheaf into the knot and so produced a rounded sheaf. Then, sliding the sheaf off his lap, he gave it a half roll, dragged it for an instant to straighten the butt, then released it so that it lay straight on the ground with the knot downwards. This operation required very little skill, provided that the heads of the sheaves were separated from each other. This again required a manual operation. The puller operator was transferred from the usual position at the rear of the machine and was placed in the front of it facing the table. It was found that he could separate the heads as the arms of the binder expelled

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the sheaf which was then delivered cleanly to the lap of the straightener.

By this method a man straightening on the machine can handle comfortably 1¼ tons per hour of 28in. fibre flax. One safeguard which must be adopted is the covering in of the power shaft extending from the puller to the tractor. This is most important. On no account should a man be allowed to work on the front of the machine unless this has first been done.

**(b) On the ground:**

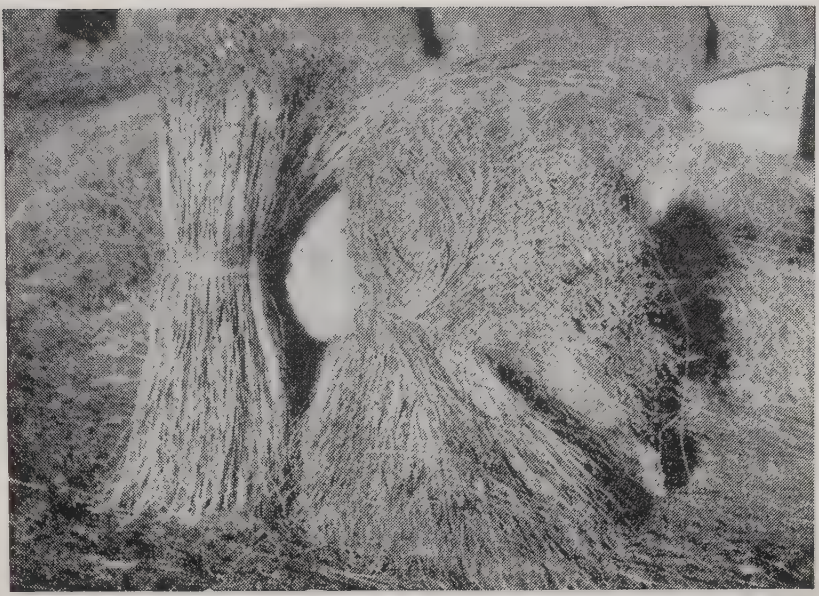
When a crop is being pulled at a rate upwards of 1¼ tons per hour, it is usually coming over the table too fast to be handled on the machine. This is particularly noticeable in tall crops yielding up to three tons per acre, or in heavily lodged crops.

In these cases, it was found better to detach the seat from the straightener's position and replace it with the usual tray. The man then straightened the crop on the ground, by pulling the fanned-out straw into the centre at the knot and rolling the sheaf over on the knot to stiffen.

This method is quite satisfactory, but requires two men to be kept with the puller. In very heavy or lodged crops, two men are also required on the pulling machine. At Fairlie much flax was harvested by this method, and an almost hopelessly lodged crop was salvaged when pulled and straightened by the foregoing methods.

## *Important Operation*

Straightening the sheaf is the most important operation in the harvest field. The results which have been achieved by treating the flax in this way are ample compensation for the time and trouble expended. Not only is the loss in processing greatly reduced as shown by the waste which comes off the deseeder, but less barre* fibre and tow comes off the scutcher which means, of course, that a greater percentage of line fibre is obtained from the crop.



Comparison of sheaves: Left straightened and right non-straightened. Note fanned side which is pulled into knot during straightening.

From the farmer's point of view, straightened flax which has been stooked not sooner than 1 to 2 days after pulling (when the sheaf has stiffened), has the capacity to turn heavy rain and also to dry rapidly afterwards.

**An unstraightened sheaf which is stooked immediately after pulling and just dumped haphazardly, sags at the band and appears to absorb excessive moisture, which causes the flax to blacken and lose much of its value. This is reflected in the allotment of a low delivery bonus.**

The cost of straightening is approximately 3/6 per ton. This is low considering that it has a most important bearing on the subsequent behaviour of the crop in the mill, and entitles the grower to a much larger delivery bonus for his trouble, should other factors such as excessive wind not upset the work already done.

Sheaf straightening has been emphasised only because of its special importance in the operations necessary to harvest the crop safely.

Even with a good sheaf delivered from the machine, there was no guarantee that this sheaf would be delivered to the mill in the same state. Measures had to be adopted to ensure that this could be done.

Straightener in act of dropping sheaf. Note the act of dragging for an instant to straighten butt.

## *Barting the Crop*

The system of barting the crop has been used in Europe as the standard method of handling the sheaves in the field. The system was tried at Fairlie last season for the first time in New Zealand, and the results were highly encouraging. It has been recognised ever since flax was first grown in South Canterbury that the risk of bad weather is very great. It seems inevitable that the weather should be bad at harvest time, causing serious loss while growers stand by helpless to cope with the situation. It seemed illogical that great care should be exercised in growing the crop in the field and in carrying out expert retting, drying, scutching and processing of the crop in the mill, while the weather, over which there is no control, could seriously upset the most important process of all—the pulling and drying of the crop in the field.

It was found that many crops were greatly spoiled through being roughly pulled and stooked and then allowed to remain in stook for periods up to

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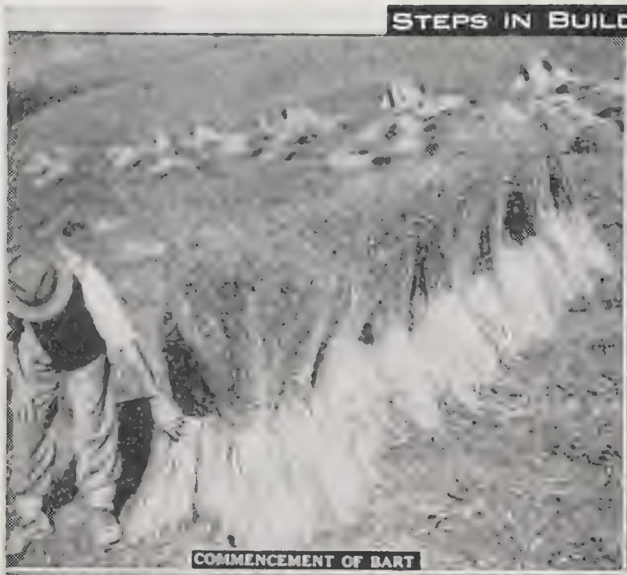
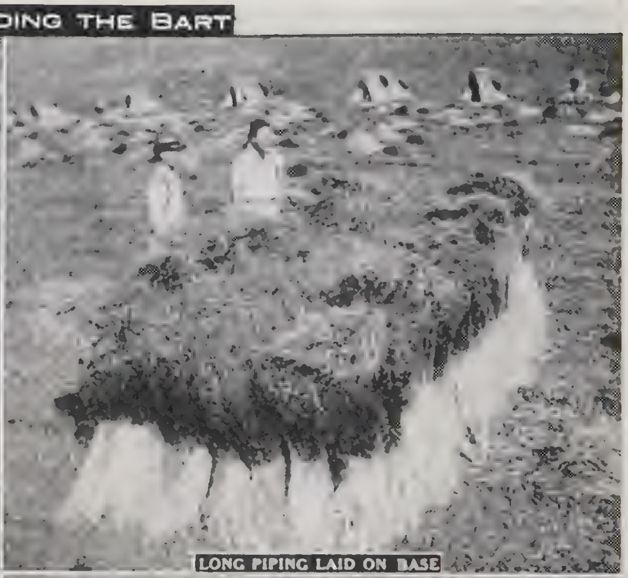
*Barre fibre is that which has become discoloured and often weakened by weathering.

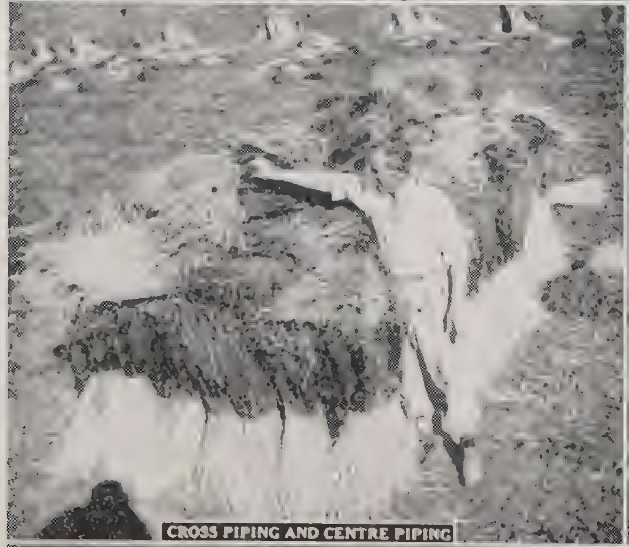
# STEPS IN BUILDING THE BART



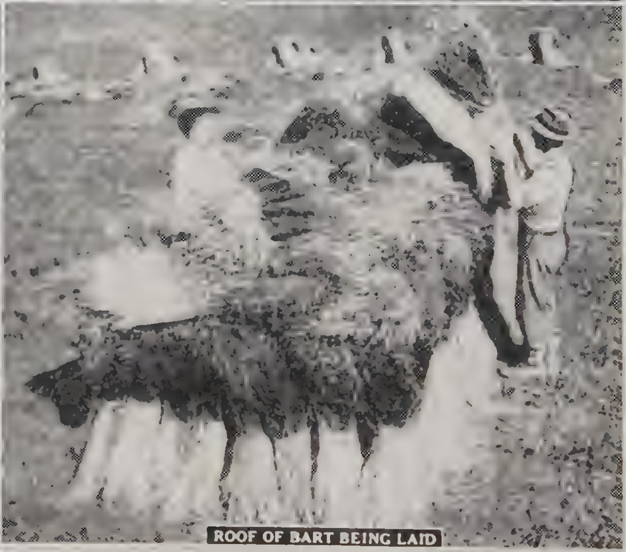
COMMENCEMENT OF BART



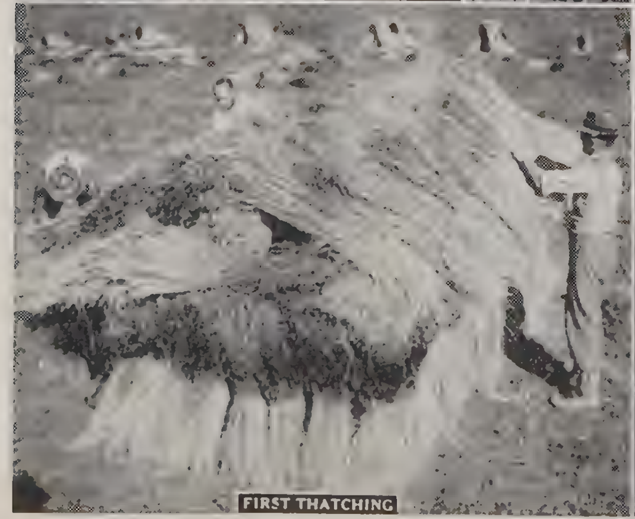
LONG PIPING LAID ON BASE



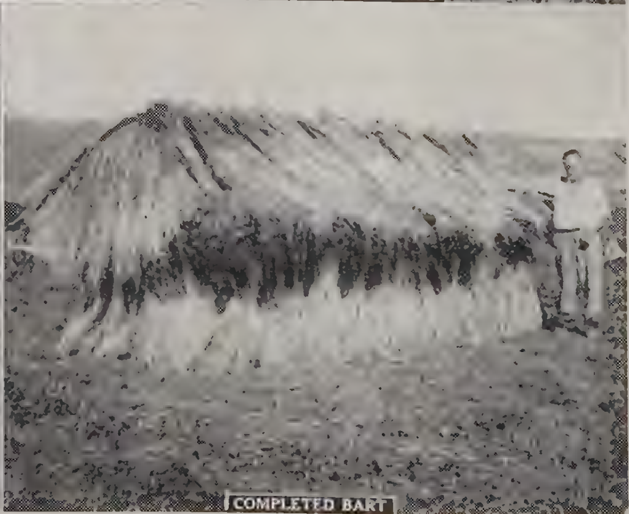
CROSS PIPING AND CENTRE PIPING



ROOF OF BART BEING LAID



FIRST THATCHING



COMPLETED BART

six weeks in all weathers. The straw because of this was blackened and spoiled beyond recognition. Often the weather was responsible. Sometimes growers were not able to devote further time to stacking through urgency of other harvest. Unfortunately, when this coincided with the handling of some of the best crops the loss was very noticeable.

**Now, however, by adopting the system of putting flax into "barts" shortly after it is pulled, the weather risk can be eliminated almost completely and a substantial advance in the direction of definitely controlling all processes vital to the production of the maximum quantity of line fibre can be made.**

A bart is simply constructed. The art of building a bart is quickly learnt —it can be built in various dimensions —but the system illustrated proved to be admirably suited to crops of up to 2 tons per acre. Longer barts can be made for heavier crops.

The construction is as follows:—

1. **Base:** Usually of six to eight rows wide according to the size of sheaves. The beginning of the base is actually an elongated stook at least 12 sheaves long or longer if desired. It was found at Fairlie in a crop of 2½ tons per acre that eight rows of sheaves were wide enough to permit pitching and thatching of the roof. The outer row on both sides must be perpendicular, so that any water from the eaves is thrown clear. It will be noted that standing the sheaves on their ends in this manner allows plenty of air to circulate. This is the whole secret of successful barting.

2. **Long Piping:** When the base is finished, a row of sheaves is placed along the outer edge (both sides) lengthwise on which rests the cross piping. In wide barts another row of long piping is laid along the centre as well, giving support for cross piping.

3. **Cross Piping:** Sheaves are now laid across the base of the bart corresponding with the sheaves forming the base. This operation will require twelve or more sheaves, depending on the length of the bart. In a bart of eight rows an extra row of long piping is required down the centre to support the cross piping in the centre.

4. **Centre Piping:** Sheaves are laid right down the centre of the bart (as illustrated) on top of the cross piping. As one row is scarcely sufficient in an eight-row bart another is sometimes laid directly along on top of this again so that the centre piping is actually two sheaves high. It will be found that the sheaves remain in position quite securely.

Crop being stooked. Note sheaves are lying straightened as they come off machine, separated and ready to stook.

5. **Roof:** The roof is now formed by laying sheaves along the bart from the apex of the centre piping to the long piping on the outside edge at the eaves.

6. **Thatching:** Eight or so sheaves are laid open and thatch is laid, beginning with a band along the eaves, and then there is a further layer above that, reaching down from the ridge. Except for tying down, which is just a matter of running twine lengthwise along the thatch to hold it in a wind, the bart is then complete.

## A Few Points

It was found better to face the bart end on to the prevailing wind. At Fairlie the barts illustrated withstood three very heavy north-westerly gales. The more open a bart is built, the more successful it will be, both from the aspects of conditioning the flax and withstanding wind. In practice, it was found that plenty of air space was left automatically. Flax can be treated in this manner as soon as the straw becomes stiff, usually one or two days after pulling.

An eight-row bart twelve sheaves long holds approximately 8cwt. of crop. This can be built by three men in twenty minutes. It may take longer until the team becomes skilled, but a third to half-an-acre an hour is estimated to be reasonable time for barting with three skilled men in a 2-ton per acre crop.

Thatching and tying down appeared to take the longest time as reasonable care had to be exercised to spread the thatch evenly. The thatch did not show the deterioration expected, and, in fact, was included in the line fibre eventually.

**There was no loss of weight in the barted straw, although the barts were in the paddock for six weeks with heavy rain and windy weather.**

The portion stacked had no weather in stook, and was stacked within a fortnight. Barted fibre sold at one grade higher, and produced very much less barre flax which, usually a stained fibre, is separated from the line fibre.

The flax retained its colour and was not blackened or bleached or unduly dried out as would have happened had it been left in stook. Carting out of the stook in north-westerly winds dried out the flax, and it appeared to weigh in much lighter than estimated—in some cases as much as ½ a ton lighter per acre. Losses were not so apparent in flax carted from barts.

A comparison of results of the two treatments is as follows:—

| | Barted. | Stooked & Stacked. |
|---|---|---|
| Crop weight | 21 tons | 18 tons |
| Treated as possible barre | 14cwt. 2qrs. (3.4%) | 2 tons 12cwt. 3qrs. (14.7%) |
| Deseeded loss | 12.9% | 15.9% |
| Line fibre .. | 11.5% | 11.1% |
| Grade .. .. | DD | CD |
| Ratio line fibre to tow .. | 100 : 38 | 100 : 47 |
| Grade tow .. | 2 | 3 |

As the portion treated as barre during processing was graded CD it was included in the stooked and stacked portion, so in actual fact no barre was graded from the whole crop. This was highly creditable considering that 21 tons had stood in barts during six weeks of variable weather. On the foregoing figures, the results indicate that the barted flax was worth approximately £1 10s. to £2 per ton more to the mill than the stooked portion. This should be emphasised since in the future crops will be bought on yield and grading.

Field of barted and stooked flax at Allandale, Fairlie.

## *Returns to the Grower*

The delivery bonus on this crop was 25/- per ton, the maximum it could attain, which brought the final return of £10 per ton. The expenditure of approximately 10/- per ton for straightening on the puller (1 ton per man per hour), and for barting (say ½ ton per man per hour with wages at 3/- per hour) was well warranted. In succeeding years, with payment according to fibre yield and grade, this crop would have been worth approximately £15 per ton delivered at the mill. The small amount of extra labour involved is patently well worth while, because no further plant, such as is required for stacking, is needed.

## *Conclusion*

It should not be necessary to bart the whole crop in any flax growing district so long as the weather remains fine and the material in stook maintains its quality. But crops valued at £7 10s. per ton provisional valuation should be barted if there is any risk of their having to run the gauntlet of time and weather. This may demand a special team to follow the pullers for the work, but it would be well worth while. This not only ensures maximum care of the crop but also uniformity in raw material which is the essence of the economic management of a processing concern such as the linen flax mill.

Much work remains to be done in the direction of good handling of flax, but from the experience gained last year at Fairlie it is felt that by straightening and barting at least the best of the crop good progess will have been made towards the establishment in rural areas of a stable industry capable of paying its way. The flax industry, worth approximately £25,000 per annum to the farmers and working men in each district, provides also work and amenities for some 50 employees.

## *Acknowledgments*

The writer is indebted to Messrs. J. P. O'Neill, W. H. Collins, and W. H. Campbell, on whose properties these operations were carried out, to Mr. J. W. Hadfield, Director of the Linen Flax Section, and to Mr. R. C. Shaw, manager of the Fairlie Mill, for assistance in organising the work and providing information.

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# QUALITY BOARS BASIS OF SUCCESS

## *Folly of Using "Scrub" Sires*

By C. H. M. SORENSEN, *Supervisor, Taranaki District Pig Council.*

THERE is, perhaps, no truer saying than "the boar is more than half the herd." All countries that have made a success of their pig industry have concentrated on the introduction of high-quality boars, even to the extent of giving encouragement to the establishment of boar clubs. Our general system of farming forces us to arrive at the desired position from rather a different angle, and the number of boars kept in New Zealand is somewhat out of proportion to the number of sows; but, because of labour difficulties and other factors, farmers with only a few sows would generally rather keep a boar than be bothered with the transport of sows to and from a central station or "boar club," and as a result sows are sometimes mated to a "scrub" boar of no known parentage.

ONE of the first things to appreciate is that no real progress can be made if the folly of using the scrub boar is not fully realised. While great improvement has been made in the carcass quality of our pigs over the past 10 years, there are still far too many scrub boars in use, and their influence is a menace to the industry.

### *Dear at Any Price*

Those who keep careful records realise that an inferior boar is costly at any price. For instance, the progeny of different boars used in the same herd may give widely different results. Boars of similar type may or may not differ in their influence on the grading of their offspring, but a purebred boar of correct conformation and good breeding may be expected to sire progeny which will be even throughout and grade better as carcasses than the progeny of the scrub boar. If two such boars during their breeding lives sire 400 pigs each and the progeny is marketed at bacon weights, it is possible that, due to lack of length, excessive fat, heavy shoulders, and unevenness of the carcass, the progeny of the scrub would be graded down and paid for below the prime 1 schedule. This difference in 400 pigs would amount to over £100. Can producers afford to take this risk? It is highly probable also that the progeny of a superior boar would prove more economical as a feed converter and reach marketable weights in less time.

**Taking all these factors into consideration, it is no exaggeration to say that few boars purchased for less than treble the price of a first-grade baconer are a good investment, and yet the price of a commercial pig is all that many farmers are prepared to offer for a boar. Small farmers, in particular, with only two or three sows, feel it is over-capitalising production to pay the price for a really first-class sire.**

### *Selecting a Sire*

However, there are several ways of approaching this question. For financial reasons it may be decided to purchase a weaner boar, or better still a boar four or five months old, when it is easier to determine the general character and conformation of the pig than it is at the weaner stage, but in both cases some information will be required about the reproductive ability of that particular strain, and where the breeder has kept litter and carcass quality records he should have no difficulty in providing it. Alternatively, it may be decided to purchase an older animal ready for work, one which as far as can be judged will improve the conformation of the pigs he sires—a boar with strength to compensate for any weakness that the sows may show. This is important, especially with purebred pigs, as many of them are distantly related and very often a weakness apparent in both the boar and the sow is exaggerated in the progeny.

The importance of using a good boar can never be overemphasised. Pigs provide only carcass: there are neither wool nor milk factors to confuse the issue. All that is wanted is a good carcass, produced by quick-growing, efficient feed converters.

This may seem confusing and make it appear most difficult to buy a high-quality animal. Care in selection is very necessary, and the boar, particularly to the beginner, is the most important animal in establishing a pig herd. His personality will find expression through all the sows, and the difference he can make to the year's production financially is considerable. It is a good policy, where possible, to look around the various shows and form a mental picture of what a boar should look like; assistance in this can be gained from the opinions of the judges who place the animals in their different classes.

### *. . . As Handsome Does*

It is not always advisable to purchase a show champion at a high price on his show record alone. The good boar must first be able to transmit his qualities to his progeny, a potentiality which cannot be determined just by looking at him in the pen. Secondly, one starting out in the pig business with the object of becoming a pedigree breeder is hardly in a position to capitalise his purchase until his stock has given him some introduction to the public, or the progeny have proved their worth as carcasses at the works.

When he has formed a good idea of what is wanted, the prospective buyer should consult a pedigree breeder in his district. Most good breeders are keen to help where an endeavour is being made to improve stock, and to assist in what amounts, in many cases, to an extension of their hobby.

**An examination should be made of the extended pedigrees of the animals which appeal, and if large litters and early maturity are expected, particular attention should be paid to these factors in both the sire and the dam of the boar it is intended to purchase. These particulars are real and mean more than just a pretty pig. After all, the foundation must be sound if a success is to be made of pig farming, and this can be established only by litter and carcass quality records.**

### *Characteristics*

The following points stand out when checking over the qualities of a high-class boar who has character—a combination of type, quality, breeding, and masculinity—and is a nicely-balanced animal.

**Head:** Medium broad snout, wide between the eyes and ears, ears fairly

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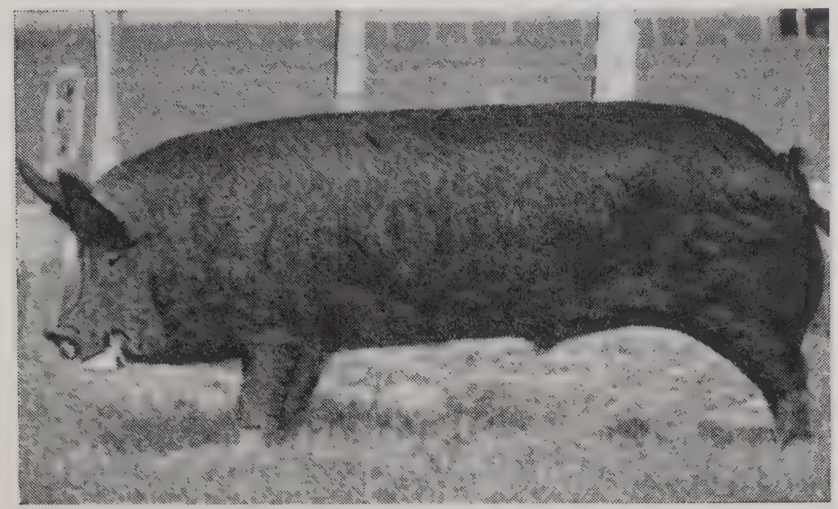
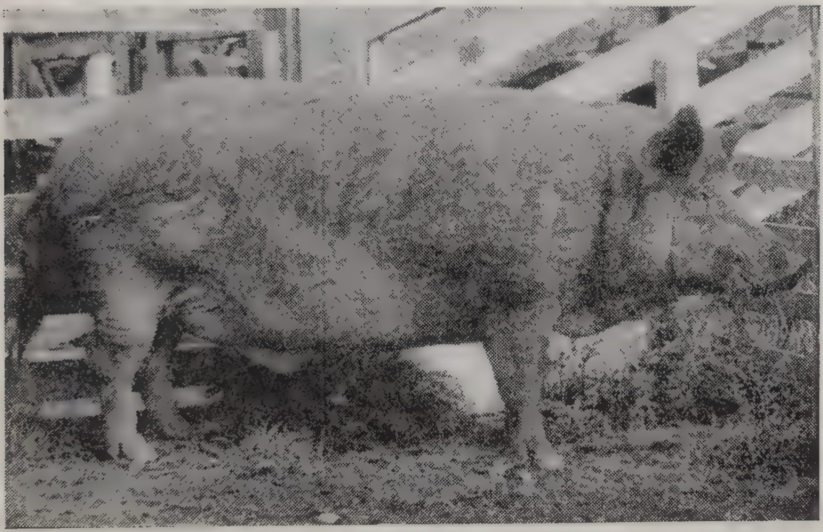
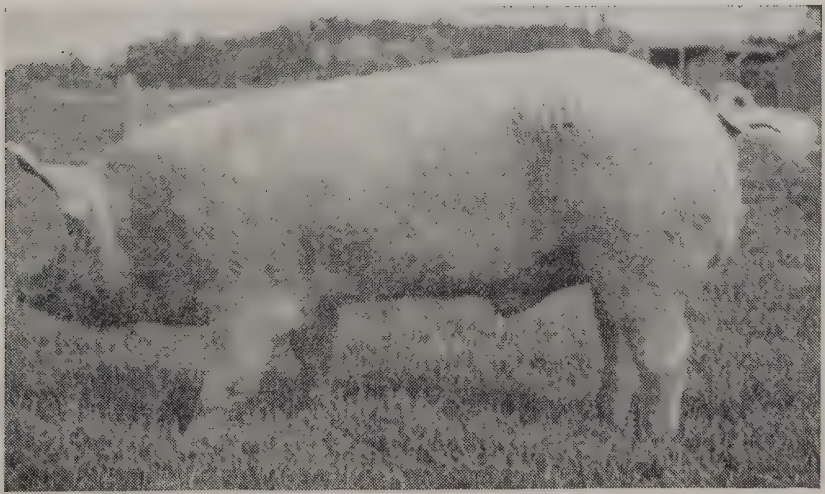
# BOARS OF LEADING BREEDS



Berkshire



Tamworth



Large White

large and fringed with fine hair, light jowl.

**Neck:** Fine, evenly set on shoulders, and free from wrinkles.

**Shoulders:** Blades strong, not coarse, and well sloped.

**Legs and Feet:** Short, straight, and strong, set wide apart, standing well on toes, and a good walker.

**Back:** Long and slightly arched, tail set reasonably high.

**Sides:** Level and deep, ribs well sprung, not round.

**Hams:** Broad, wide, and deep to the hock.

**Belly:** Straight underline, deep through the heart, and with at least 12 well-placed teats.

**Bone:** Well developed.

**Skin:** Fine and free from wrinkles.

**Hair:** Long, fine, and plentiful.

With such a boar a pig farmer begins on the right lines, and can expect the return from the piggery to show a substantial increase.

## *Management*

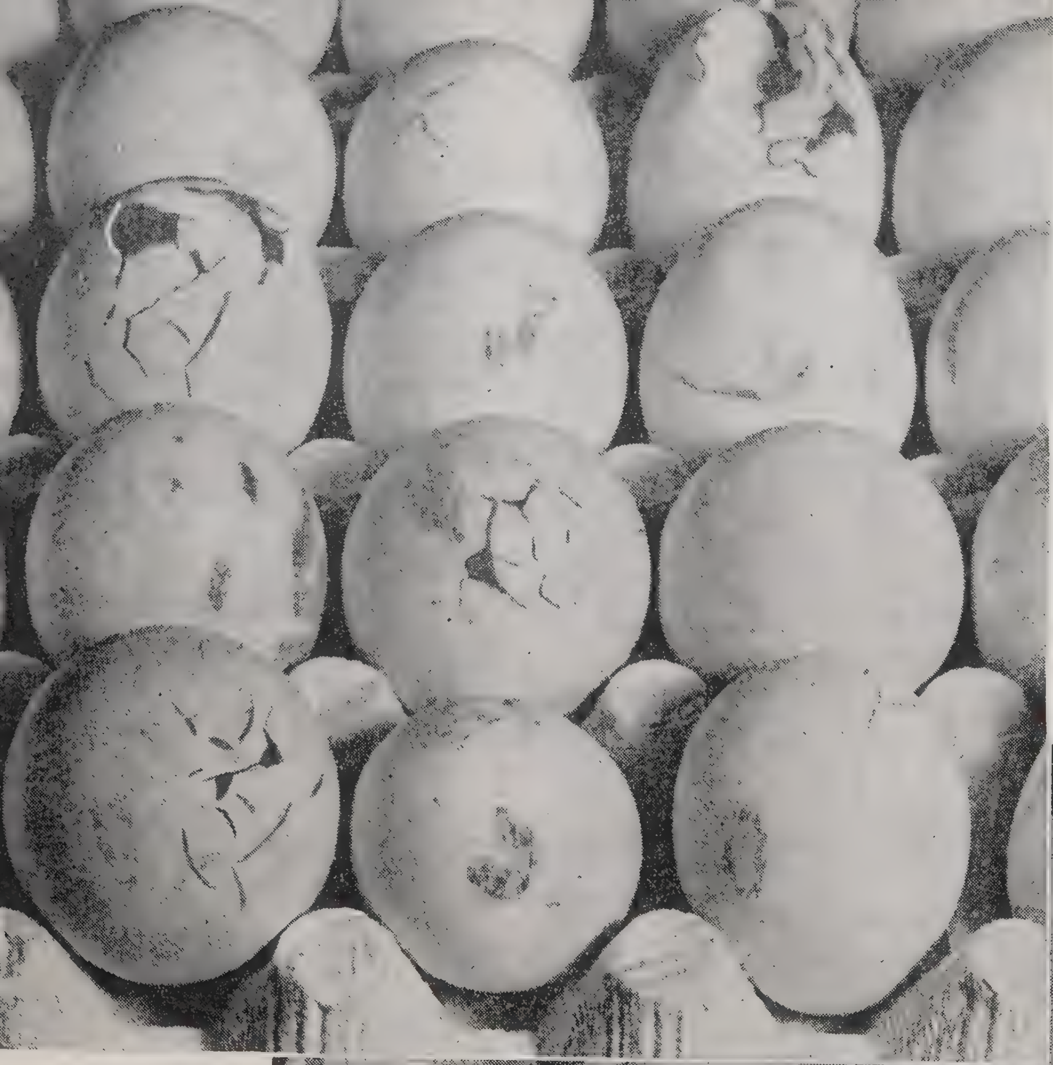
A separate pen should be prepared to accommodate a new boar. He cannot be expected to live with a lot of hungry, angry sows before they have become reconciled to one another. During the mating season the boar should not have free range with the sows. Some weeks before the boar is required for service he should have a meal ration, to ensure that he is at his best, especially if winter feed has been in short supply. No sheep farmer would consider putting weak-conditioned rams out with his flock, and the boar is entitled to the same consideration. He should always be in good condition, but never really fat. He should always be treated kindly, but firmly; otherwise the consequences might be serious to the owner in more ways than one.

The boar paddock should always be well fenced. Once the boar develops the habit of crawling through a weak fence he will be very hard to control; it is easier to prevent the habit than to control it.

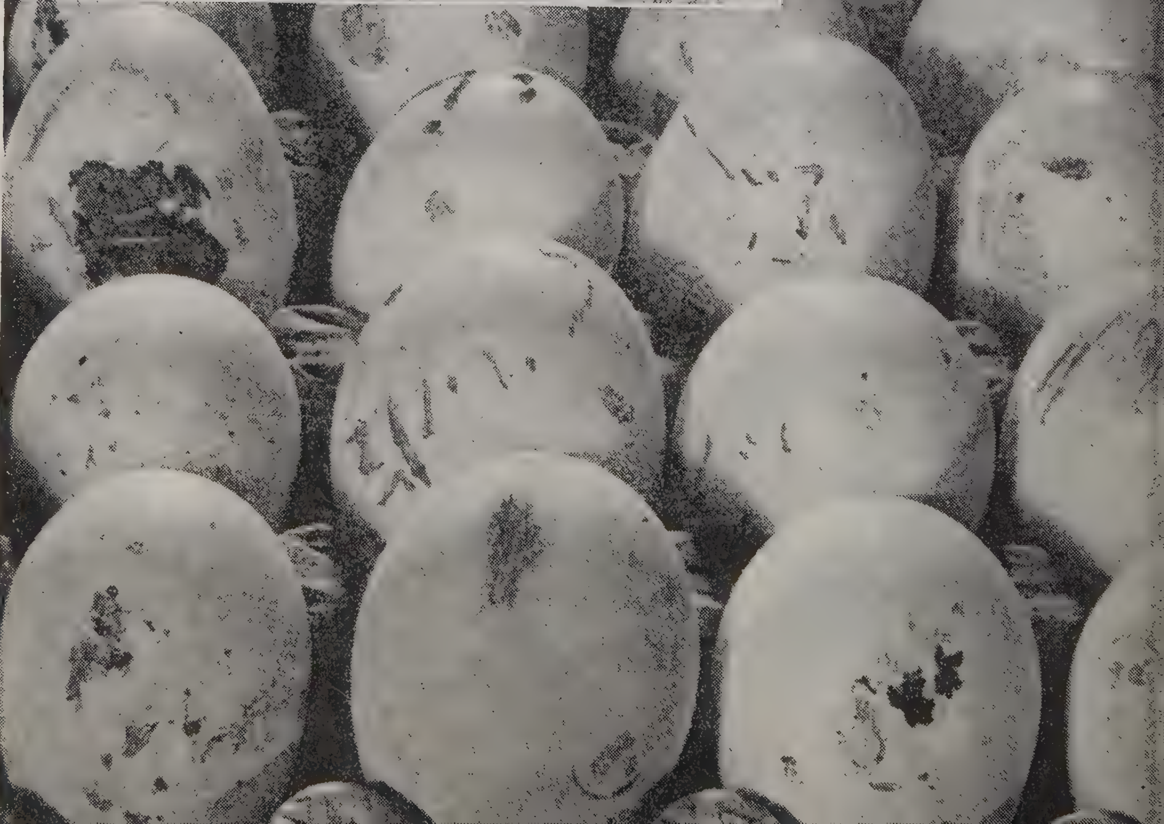
If the boar is to be used by neighbours, insist that the sows be brought to the boar. The taking of a boar from farm to farm often leads to a desire to roam, and damage done to other people's property is frequently the cause of neighbours becoming very unfriendly, and the boar difficult to handle.

"The boar is half the herd," and the treatment he receives largely determines the profits which can be expected from the piggery.

During the war, when quantity in eggs rather than quality was the first consideration, even eggs marketed in the disgraceful condition of those pictured on this page found a sale. Under normal conditions, when demand may again exceed supply, the public will refuse unattractive, dirty eggs, and producers will have to return to good marketing practice. Cracked eggs deteriorate rapidly and travel unsatisfactorily; weak-shelled and stale eggs irritate the consumer.



Above: Cracked and stained eggs.



Right: Dirty eggs.

Actual photos of eggs sent in to egg floor by a commercial producer.

*Markets Can be Held With*

# ONLY QUALITY EGGS

By **F. C. BOBBY**, *Superintendent of Poultry Husbandry, Wellington.*

DURING the war there was an ever-increasing demand for eggs, and poultry producers were induced to increase their flocks and to put every available egg through egg floors. The demand was for quantity; quality, both external and internal, was given secondary consideration. Consumers were forced to take the eggs offered and at a ceiling price, irrespective of quality.

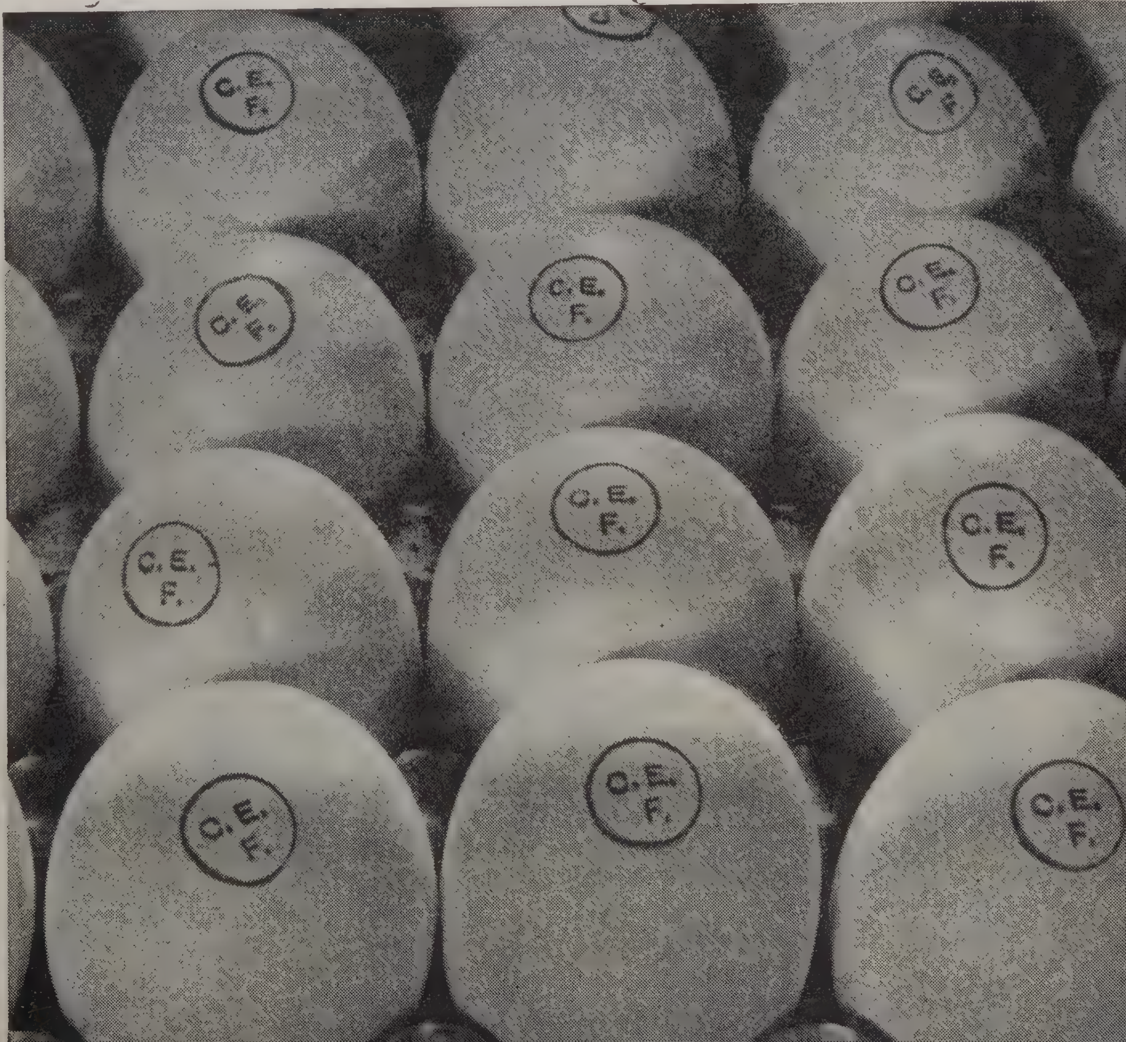
Producers must now realise that under normal conditions, when the supply may exceed the demand, *quality* in eggs is as important as quantity to the majority of consumers. The future success of the poultry industry in New Zealand depends upon a high rate of consumption of eggs per head of population, which will be achieved only if the public are offered a quality egg in an attractive manner. Soiled and dirty eggs heaped in a shop window are repulsive and unattractive to consumers. Efficient post-war marketing may be achieved, but this will be largely unavailing if the eggs handled are of second quality only. The public demand a quality egg and the future of the poultry industry depends upon meeting this demand.

## *Bad Habits Formed*

During the war poultry producers worked under difficult conditions. Shortage of labour made egg-cleaning operations and all details of management which lead to the production of clean eggs very difficult. Since all eggs sold, whether clean or dirty, brought ceiling prices, there was no inducement to market a quality egg; the tendency was rather to become slack in these matters and bad habits have been formed—habits which have to be rectified and a return made to good marketing practice on the farm.

## *What is "Good Quality"?*

Quality in an egg is somewhat difficult to describe, but may be expressed under two headings: (a) external quality, and (b) internal quality. The consuming public in future will demand both.



*AS*

*EGGS*

*SHOULD*

*REACH*

*THE*

*PUBLIC*

(a) **External Quality.** To look attractive an egg should be free from dirt and stains. It should have a natural "bloom" on it. The aim therefore of every producer should be to market a **clean egg and not a cleaned egg.** A cracked egg, damaged by even the almost invisible hair cracks, will deteriorate more rapidly than a sound-shelled egg. Cracked eggs also do not travel satisfactorily. They may even break in the bag carried by the consumer, and they will certainly ooze white if boiled and thus generally irritate the person upon whom the producer depends for his living. Similar comments apply to soft or weak-shelled eggs, which invariably irritate the consumer. It should be remembered always that the consumer judges eggs in the first instance upon their size and external appearance.

(b) **Internal Quality.** The consumer is forced to buy eggs on trust; there is no guarantee that the contents of an egg will be satisfactory in quality. Thus if the egg-consumption rate is to be increased, the poultry industry—producer and marketing organisation alike—must build up the public's confidence in the eggs that are offered for sale. Quantity sales will follow improved quality; there is no side-tracking this fact. Stale eggs are unappetising, bad or tainted eggs nauseating. Internal quality goes further than just freshness and freedom from odour. The white of an egg should be firm, the yolk of a good rich colour, and the latter should stand up boldly in the white. Such eggs will cook satisfactorily in any form, while the whites will whip successfully. It should be remembered also that eggs are today recommended for very young children to whom only the finest quality should be given. These are points which count with the housewife, upon whom producers are dependent for their livelihood.

## *How to Ensure Quality*

Close attention to a number of small details, which are summarised below, is the first essential in the production of quality eggs.

### (A) External Quality.

**1. Clean eggs:**

(a) Place nest boxes as far as practicable away from popholes leading out on to dirty ground, and keep the litter in the house clean.

(b) Check nest box litter constantly to see that it is adequate in quantity and clean. Remove daily any droppings or egg material from broken eggs found in the nest boxes.

(c) Prevent birds roosting in the nest boxes at night. They invariably leave quantities of droppings behind them.

**2. Cracked eggs:**

(a) Lack of litter in a nest box with a wooden or metal floor will lead to eggs being cracked as they are laid.

(b) Over-loading buckets or wire baskets will cause excessive pressure on the lower layers of eggs and cause hair cracks in the shells.

(c) Placing large eggs in egg crate fillers which are too small for such eggs leads to the tops of the eggs being broken or the sides cracked.

(d) Lack of oyster shell or other suitable minerals rich in lime will starve birds of an essential material with which to build good shells. Include minerals (2 per cent.) in the laying mash **and** supply oyster shell or lime grit to the birds at all times.

(e) Forcing birds for heavy egg production with an excess of meatmeal will also cause a deterioration in the quality of shells.

(f) Never attempt to incubate eggs with poor-quality shells—shell quality is an inherited factor.

### (B) Internal Quality.

The contents of an egg should not only be of good quality when fresh, but the egg should also have good keeping qualities. Most commercially-produced eggs are sold in a more or less distant market, and the time lapse between the laying of the egg and its consumption accentuates the importance of keeping quality.

**Complaints about egg quality are most common in the hot weather usual after Christmas and in the New Year. It has been common in the past to warn producers at this season. Today, however, this warning has become of greater importance. With the war over and egg supplies increasing, the public demand for an improvement in the quality of eggs is very real. Producers should bear this in mind, act accordingly, and assist in establishing efficient post-war marketing. It is a clean egg that is required and not a cleaned one—an egg in which the buying public can have complete confidence.**

**1. Effect on quality of washing dirty eggs:**

However careful a producer may be, some dirty eggs will be collected daily, particularly during winter. These eggs must be cleaned, and dry cleaning is best, as it does not affect the keeping qualities. At present, however, most eggs are washed with water, either in buckets or on a washing machine, and only those eggs which cannot be cleaned by the easy removal of a small piece of dirt should therefore be washed; never put all eggs—clean and dirty—in the washing bucket or over the machine. An unwashed egg keeps better than a washed one.

It is essential to keep the tapes on washing machines as clean as possible and free from slime. Dirty washing machines and dirty egg water in a bucket spread germs and mould spores, which in warm weather cause eggs to go bad very rapidly.

**2. Eggs should always be kept cool:**

(a) Do not pack eggs while they are shell-warm.

(b) Do not collect eggs in buckets or baskets and then leave them standing in the hot sunshine, as is often thoughtlessly done.

(c) Egg rooms should be well ventilated, in a cool position, and without a window facing the sun. Deterioration in quality is often started in a hot and stuffy egg room.

**3. Eggs for market should be infertile whenever possible:**

As soon as the breeding season is completed all males should be removed from the flock. Fertile eggs, particularly those which are left in the nest boxes all day and may have a broody hen sitting on them, are most likely to deteriorate rapidly. Often during hot weather the germs in these eggs start to develop, then die, and finally turn the eggs bad.

**4. Egg quality and food:**

Apart from the part played by minerals in the formation of shell, there is little evidence that food and food quality affect the internal quality of an egg. Poor quality food cannot, therefore, be blamed for poor egg quality.

**5. Egg quality and the constitution of the stock:**

There is ample evidence that egg quality is influenced by the health and constitution of birds. This applies particularly to poor-quality whites, a trouble that is much on the increase and evident during the flush season. Eggs with poor-quality or watery whites travel badly and often the yolks run into the whites when the eggs are broken open for cooking purposes. These points again emphasise that stock of good constitution is all important on the successful poultry farm.

**6. Blood spots:**

Eggs containing blood spots should not be marketed. An excess of such eggs means a loss to the producer, but an excess need not be feared unless the birds are forced.

### CHICK REARING.

"Chick Rearing," Bulletin No. 199, has just been issued by the Department of Agriculture. It is a very comprehensive treatment of a vital aspect of poultry husbandry. Copies are obtainable at 6d. (post free) from offices of the Department at Auckland, Wellington, Christchurch, and Dunedin.

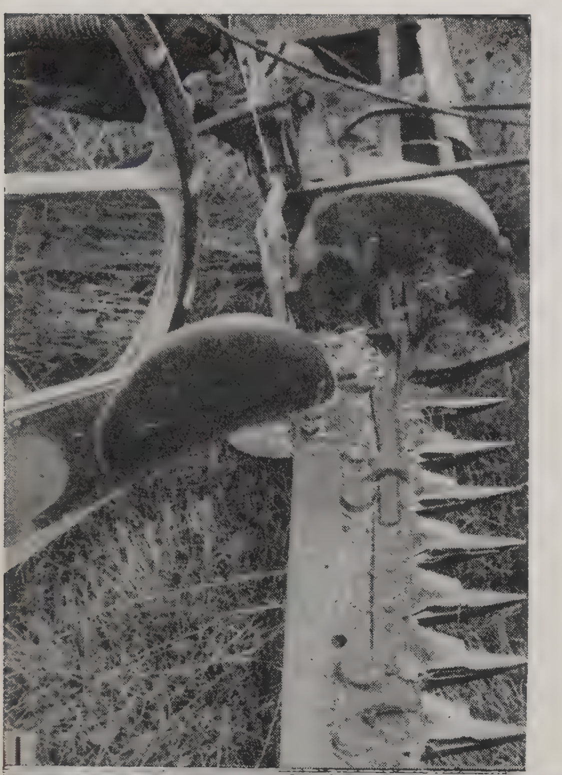
# HARVESTING WHITE CLOVER

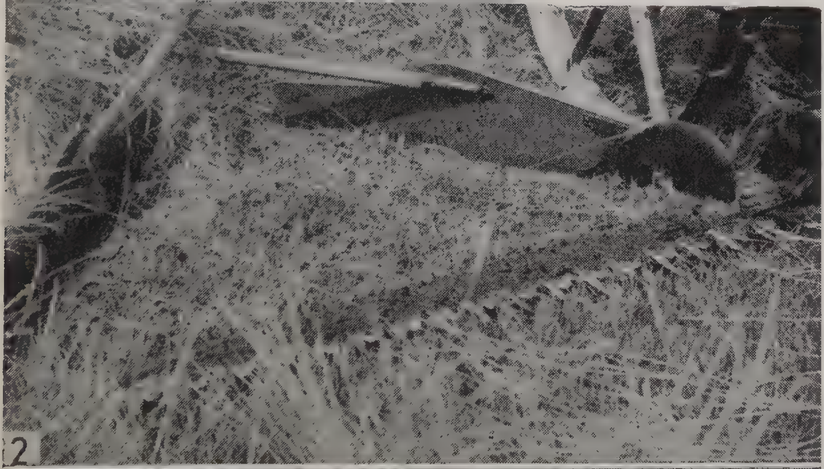
*By* R. INCH, *Fields Instructor, Ashburton.*

WHITE clover seed is valuable, and every effort should be made to harvest it. At one time the general practice was to stack all clover seed and thresh it with a clover huller, but of late years it has been found that a satisfactory job can be made with a header harvester. Only occasionally, under exceptionally good conditions, can the crop be direct headed, the usual practice being first to mow the crop and allow it to mature in the swath, and then to use a pick-up attachment on the header for threshing.

Where a heavy crop of ryegrass is harvested with the clover, and the growth is tangled, the divider has difficulty in drawing the cut material far enough away from the standing crop to make a good clearance. The outer edge of the next cut then tends to fall back over this, and the resultant tangle is difficult to pick up with the header. By fitting an extra divider on the inner end of the cutter bar, as shown in the illustration, the grass is drawn away from this end also, thus leaving a clear space between the swaths and enabling the header to have a clear run. The attachment is also useful in a very light crop to gather the scattered seed heads into a row that the pick-up can lift. A bracket for holding the inner divider is simple in construction and can be made by any blacksmith or handyman, but some of the machinery firms now stock the complete divider as a standard extra.

Horse-drawn mowers usually have a cutter bar 4ft. 3in. to 4ft. 6in. in length, and in the majority of crops little difficulty is experienced in picking up the swath from these machines with a pick-up attached to a 5ft. or 6ft. header. In a heavy crop it is not advisable to cut a swath wider than the cut on the header, as these machines are originally built to head standing crops, and within reasonable limits they function better if not overtaxed with a heavy amount of material. In light crops, however, there is no reason why the 6ft. or 7ft. cut of a power mower should not be used, and the swath made narrower with the aid of the extra divider.





1. A close-up showing bracket and method of attaching cutter bar. 2. The extra divider prevents the swath from overlapping the previous row. 3. A heavy crop in swaths made with two dividers.

◆

### FARMING IN THE AUCKLAND PROVINCE.

During his journeys through the Auckland Province from 1934 to 1936 Mr. P. W. Smallfield noted his observations on farming methods. His diary was considered so interesting and valuable that it has been revised and published in booklet form. The province has been divided into seven parts, each of which is dealt with individually, and there is a special chapter analysing farm management. Bulletin No. 213, "Farming in the Auckland Province," is available free from offices of the Department of Agriculture.

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# Rearing Queen Bees

## Essential Factors In Apiary Management

By E. SMELLIE, *Apiary Instructor, Christchurch.*

**OF all the factors contributing to the prosperity of a colony of bees the most important are the prolificness of the queen and her other traits. Unless the queen is capable of laying 1,500 to 2,000 eggs daily for a short period in the spring and unless she is also able to maintain a high daily average over the rest of the season, the colony will not be able to produce a maximum of surplus honey.**

IN spite of this, however, some beekeepers, while paying a great deal of attention to other details of apiary management, entirely overlook the importance of a systematic requeening programme.

While facilities are available to beekeepers for securing queens of selected stock from queen breeders, the cost and risk of loss or damage in transit, especially with queens that have been laying heavily, render it highly desirable that commercial beekeepers raise as many of their own queens as possible.

Systematic requeening of apiaries is now generally advocated. Beekeepers who wish to give more attention to this phase of apiary management can successfully rear queens once the fundamental requirements and details of queen rearing are thoroughly understood.

### When to Requeen

In some apiaries systematic requeening is accomplished while the colonies are building up for the main honey flow, but as spring requeening involves an interruption in the continuity of brood-rearing, a condition which is sometimes followed by the development of an early swarming impulse, or the superseding of the newly introduced queens, this work is better done in some districts during the later part of the main honey flow when these difficulties are not likely to be encountered.

**While an autumn queen-rearing programme would interrupt honey extracting operations to some extent, the benefits to be derived would be considerable. A failing queen, irrespective of the time of season, should always be replaced as soon as possible.**

In some North Island districts where conditions are suitable for egg-laying throughout the year, or where the queens have only a short period of rest, annual requeening is recommended. As the South Island climate causes the queens to cease egg-laying for a fairly long period, replacement could be postponed until the second year, but annual requeening is desirable, and should be carried out where possible.

### Selection of Breeder

A purely-mated Italian queen should be selected for a breeder, as the Italian strains which have been propagated in New Zealand are eminently suited to our climatic and honey flow conditions. As Italian bees have proved their superiority to other bees introduced into New Zealand the majority of commercial beekeepers have adopted this strain.

The type of queen which should be used as a breeder is one that has headed a colony of bees which have displayed little tendency to swarm and which by their diligence have secured a large surplus of honey. The queen should also be prolific and produce workers that are gentle and steady when being manipulated by the beekeeper.

### Selection of Drones

Since mating cannot be controlled, the breeding of drones from desirable strains can be encouraged by giving chosen colonies a good supply of drone comb. The flight of drones from colonies that are not suitable for breeding can be retarded by the use of Alley drone traps and by bruising the cappings of drone brood with a hive tool.

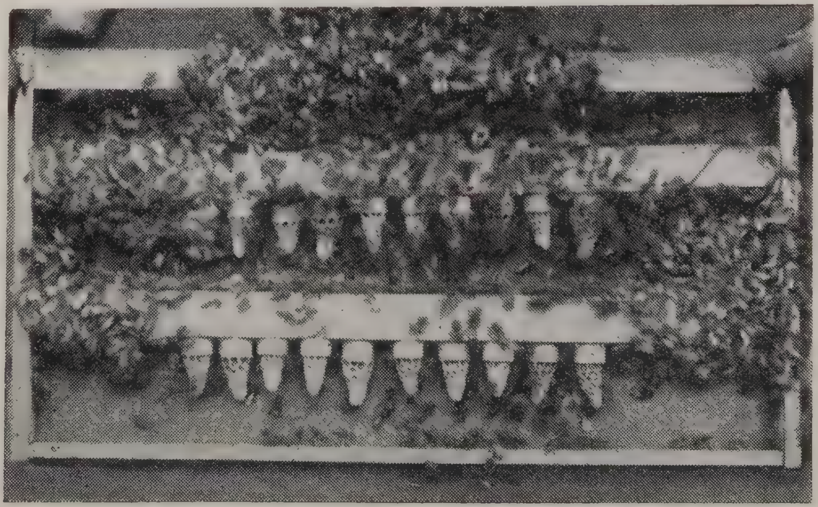
### Cell-raising Impulses

All queen-rearing methods aim at reproducing in a chosen colony one or more of the impulses that will cause the bees to feed royal jelly to larvae selected by the beekeeper and thus raise queen cells. The impulses under which honey bees perform this function are:

1. Swarming impulse: when a colony is preparing to swarm;
2. Superseding impulse; when a failing queen is about to be replaced by the bees; and
3. Impulse of queenlessness: when a queen has been lost or killed during the breeding season.

### Grafting Method

The grafting method is practised by the majority of commercial beekeepers under conditions which the beekeeper can create and control. The method is to transfer young larvae from a comb taken from a colony containing the breeder queen to artificial queen-cell cups—the "graft" then being placed in a "cell-starting" colony, and later transferred to a "cell-finishing" colony.



A batch of completed queen cells ready for removal.

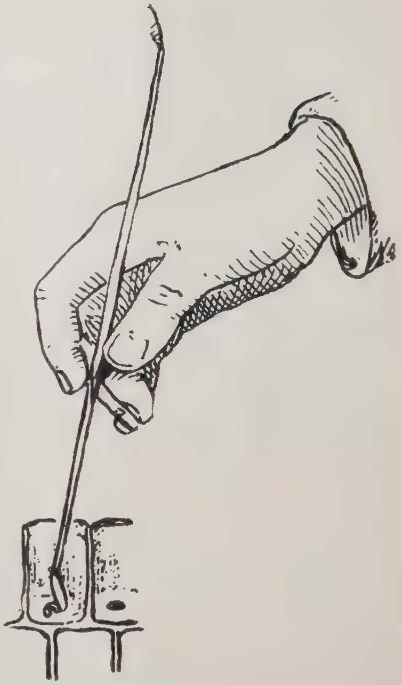
### *Cell Cups*

The cell cups are prepared by dipping a smooth stick ($\frac{5}{16}$in. in diameter) into liquid beeswax to a depth of approximately $\frac{5}{16}$in., and by alternate dipping and then cooling in cold water. By making a shallower dip each time, a cell cup with a thick base and a thin top edge is obtained.

**Cell cups made from poor quality or overheated wax may not be accepted by the bees. Cell cups must be kept free from dust or other contamination for the same reason. To facilitate the handling of individual cells they may be inserted into a hollow wooden base that is $\frac{3}{4}$in. in outside diameter and $\frac{1}{2}$in. in depth.**

Twelve to sixteen of these cell cups are attached to a wooden bar which is fitted into a special frame. A suitable frame to accommodate the bars of cells can be made by nailing wooden supports on the end bars of an ordinary full-depth frame, about 2in. and 4in. respectively from the lower side of the top bar. This arrangement allows each bar of cells to be handled separately.

A stock of royal jelly is collected from unwanted queen cells raised earlier in the season and kept in an opaque jar with a tight-fitting lid. A small portion of this jelly is placed in each cell cup to facilitate the removal of the larvae from the grafting needle. Before using jelly for grafting purposes, however, the required quantity should be diluted with clean water to the consistency of cream. Some experienced beekeepers work without the aid of royal jelly.



Use of transferring needle to pick up young larva.

### *Transferring Larvae*

A grafting needle is necessary to transfer the larvae to the cell cups. This may be made from a piece of wire that has a shallow foot $\frac{1}{16}$in. wide fashioned to an angle of 45 degrees so that it can be inserted under the larvae without injury.

In practice the smallest larvae that can be seen are selected, and preference is given to the larvae more generously supplied with food. To ensure a generous feeding of the larvae from their earliest development, the colony containing the breeding queen should be fed daily with a liberal amount of thin syrup prior to the grafting.

**Care must be exercised to select larvae of the same age for grafting. Should one group of larvae be considerably older than the others, it will mature first and perhaps destroy the remaining cells before they can be removed.**

When the larvae have been transferred to the cell cups, they should be "floating" on the royal jelly, and facing the same way up as when in their original cells on the comb. A better acceptance is generally obtained if the cell cups are placed in a hive for a few hours prior to grafting, or placed in the sunlight until they are warmed up to hive temperature before use.

### *Cell-starting Colony*

To force the bees to concentrate their attention on the larvae trans-

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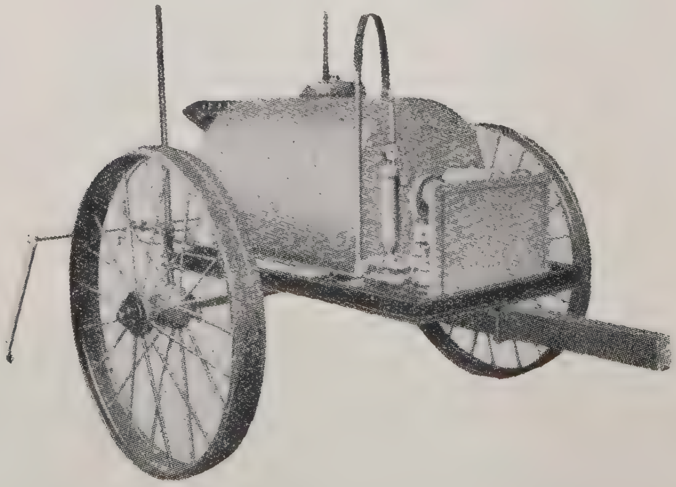

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ferred to the artificial cell cups, a strong or fairly strong colony must be made queenless and broodless. (The queen and brood removed may be placed over a wire screen above some other hive in the meantime, and returned again later). This cell-starting colony should have the hive and comb surface reduced so that the bees will be somewhat crowded in the space available to them.

A preponderance of young bees (about seven days old) is also desirable, as it is at this age that the glands which secrete the larval food are most active. To ensure this preponderance, up to ten combs of emerging brood should be given to the colony ten days before it is to be used for starting queen cells. Three days before the cells are placed in this colony, and throughout the 24 hours that the cells remain in the colony, it should be fed liberally with a syrup of equal parts of sugar and water.

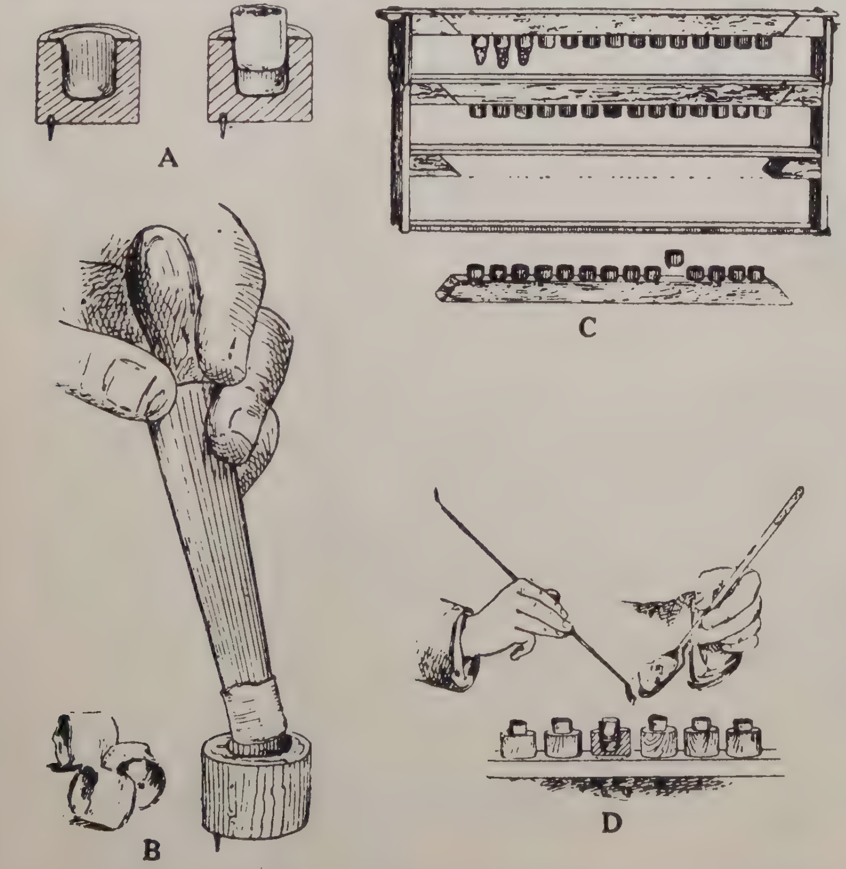
## *Cell-finishing Colony*

The cell-finishing colony should be very strong in bees, and have an ample supply of honey and pollen. A queen-excluder is placed between the brood-chambers, to confine the queen to the lower chamber, and at the same time to separate as much of the brood as can be raised to the upper chamber. The cells, after 24 hours in the cell-starting colony, are then placed in the centre of this upper chamber between two combs of unsealed brood. To ensure a more liberal feeding of the developing queens, any additional combs of unsealed brood may be substituted with combs of sealed or emerging brood.

**It is important that this colony is fed for three days before receiving the cells from the cell-starting colony and that throughout the period the cells remain unsealed.**

On the tenth day after grafting in the manner described previously the cells will be "ripe," and the queens can be expected to emerge during the next 24 to 36 hours. As the first queen to emerge would immediately kill the unhatched queens, the cells must be introduced on the tenth day to prepared nuclei or, alternatively, direct to the colonies that require to be requeened.

When only a small number of queen cells are required, the cell-starting and cell-finishing colony may be one and the same hive. During the 24 hours that the graft is in the cell-starting colony, the bees will accept the larvae and raise queen cells under the impulse of queenlessness; but later, when the brood and queen are returned to the colony (with the queen separated from the brood by a queen excluder), the bees will continue to finish the cells satisfactorily. There is no necessity therefore to keep the colony queenless during the full ten-day period that the cells are maturing.



Queen-rearing apparatus.—A, wooden cell base and wax cell cup. B, fixing cell cup to wooden base. C, prepared frame and cell bars. D, method of placing royal jelly in the wax cell cups.

## *Care of Cells*

When the cells are ripe and are ready to be transferred, the adhering bees should be removed from them by using a feather, small brush, or a little smoke, as any shaking or jarring may injure the young queens. Care must also be exercised when removing cells from the bars not to handle them in any way that will cause pressure on the queens.

When a cell is introduced to a colony, it should be placed between two combs of brood where it will receive the warmth of the colony cluster. By crushing a small area of comb, a cavity is made into which the queen cell can be inserted and held firmly in position.

## *Requeening*

An old queen is usually replaced after her removal by introducing to the colony either a ripe queen cell or a young laying queen confined in a special cage.

In preparation for the introduction of a ripe cell, the colony should be fed in the evening; and next day the old queen should be found and destroyed prior to inserting the queen cell. About ten days later the colony should be examined for eggs to make sure that it is "queen-right."

While the practice of replacing old queens with ripe queen cells requires less labour and equipment than the introduction of young laying queens, there is, however, a much greater interruption of the continuity of the emergence of young bees, as the queen has first to mate, resulting in a period of some ten days during which no eggs are laid. There is also a danger that the cell may not be accepted by the bees, or that the queen may be lost when she leaves on her mating flight, leaving the colony hopelessly queenless. Furthermore, if unsuitable mating weather prevails, the queen may fail to mate, and become a drone-layer.

**For these reasons it is prudent to utilise nuclei colonies for mating purposes, and to introduce the young laying queens in some type of queen-cage.**

## *Nuclei*

Nuclei from which the young queens take their mating flight are prepared

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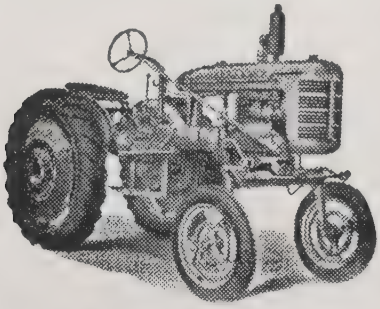

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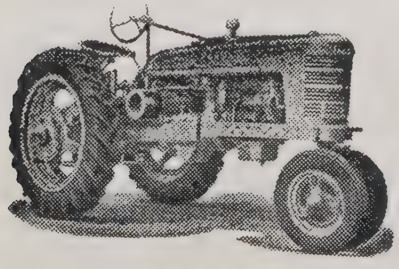

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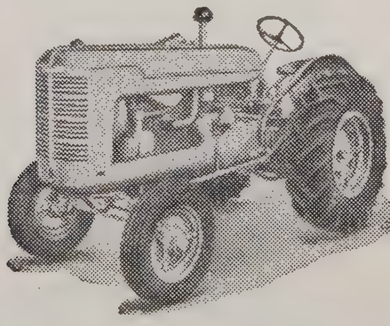

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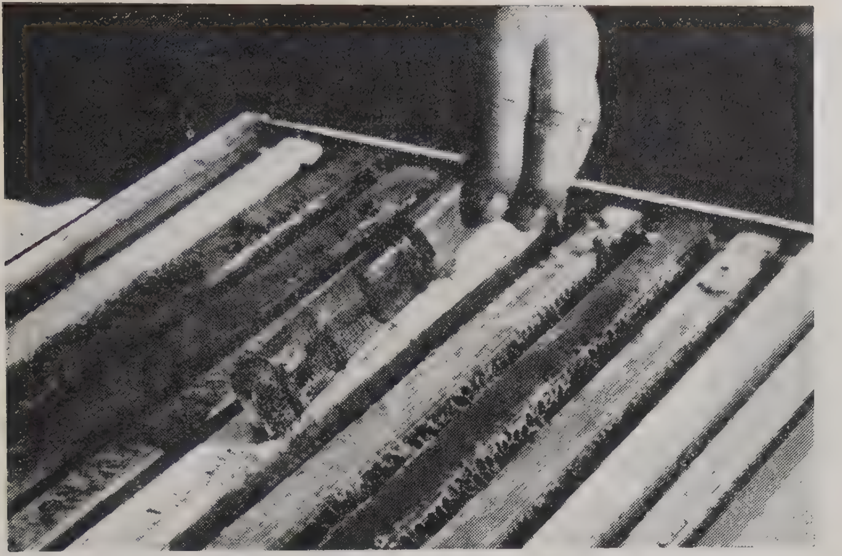

Home-made Miller queen-introducing cage.

on the ninth day after grafting by placing one or two combs of emerging brood, and another containing honey and pollen, in each nucleus hive, together with a fair quantity of bees. A division board feeder occupies the remaining space. If the bees receive a liberal feed of syrup when the ripe cell is introduced, there is little danger of their tearing it down or destroying it. As some of the field bees will return to the hive from which they were taken, more than sufficient bees should be shaken into each nucleus. To retain as many bees as possible in the nuclei, they should be confined for a day or two before the entrances are allowed to be opened.

Better results can generally be obtained by using nucleus colonies that can be placed on a separate stand, as this type minimises the loss occasioned when young queens return from their mating flight to an alien nucleus. To enable the bees to defend themselves easily against robbers, some means for contracting the entrances should be provided.

The young queens usually commence to lay eggs about ten days after emergence, but when normal egg laying has commenced in a few days' time the queens are ready to be introduced to hives that need to be requeened.

A strange queen is more readily accepted by a colony of bees during a honey flow than during a dearth of nectar, and as this condition can be simulated by artificial feeding, the bees should be fed with sugar syrup at the time the queen is introduced. To enable the new queen to acquire the odour of the colony into which she is being introduced, she should be caged in the hive for 48 hours or longer before liberation. Care should be taken to examine all the brood-combs for unwanted queen cells before the queen is introduced. Unsuccessful introduction is usually caused by neglect of this detail.

## *Queen Cages*

Several types of cages have been devised for introducing queens. A simple cage can be made from wire gauze about 6in. square. A piece about 1in. square cut out of each corner of the gauze is folded to form a small wire box. The cage is pressed into a comb to enclose a patch of emerging brood, a small area of honey, and some empty cells. This arrangement allows the caged queen to lay in the empty cells, and allows young bees, on emerging, to tend the queen, making her more acceptable to the colony when liberated some three days later by removing the wire box.

## *Doolittle Cage*

Various automatic cages in which the queen is temporarily separated from the bees by a barrier of candy are also used. The barrier of candy is large enough to give the queen sufficient time to acquire the hive odour while the bees are eating a way through for her release.

The Doolittle cage illustrates this type in its simplest form. The cage is made with a cylinder of wire gauze and a piece of round wood. A plug 1in. long is cut and fastened into one end of the wire cylinder; the opposite end is closed in the same way with a plug 2¼in. long, but this plug has a ⅜in. hole which is filled with candy lengthwise through it. The queen makes her exit through this channel, but she is confined until the bees release her by "eating out" the candy.

## *Miller Cage*

The Miller cage is similar in principle to the Doolittle cage, but as it is flat and of only ⅜in. thickness, it can be suspended in the brood nest between the combs without interfering with them. This narrowness is attained by constructing the channelled plug with two pieces of tin tacked to two small strips of wood.

A modification of the Miller cage ensures more successful introduction, as the bees can gain access to the queen some time before her own liberation is possible. This cage is constructed with two channelled plugs, each of different lengths, and with a section of zinc excluder tacked over the inner end of the shorter plug. The lengths of the two plugs are 1½in. and 2½in. The short plug is the first to be eaten out by the bees. This allows them access through the excluder section to tend the queen pending her liberation through the channel in the longer plug, which is cleared several hours later.

## *Queen Cage Candy*

Queen cage candy is made by kneading icing sugar with honey or invert sugar until it attains a consistency of dough. While this "dough" should be thick enough not to stick to the fingers, it should not be dry enough to crumble. If the candy is too thick, the bees cannot feed from it; if too thin, it daubs up the bees.

**The icing sugar used must be first grade and free from starch. A test for the presence of starch may be made by dissolving a teaspoonful of the sugar in a glass of water and adding two or three drops of tincture of iodine. If starch is present a blue colour will appear; if absent, the solution will retain the brown tint of the iodine.**

To minimise the danger of spreading brood diseases, some commercial beekeepers use invert sugar instead of honey when making candy. Invert sugar of the right density is obtained by heating a pound of granulated sugar with half-a-pound of water to which an eighth of a teaspoonful of tartaric acid has been added. The syrup is then heated until a temperature of 248-250 degrees F. is registered.

## *Feeding*

Feeding is a feature of each of the manipulations mentioned. Lack of attention to feeding under New Zealand conditions, even when there is a flow of honey throughout the proceedings, is almost certain to lead to some degree of failure. Feeding must be liberal, not only in the quantity given, but also in its rate of flow or availability to the bees. The feeding of colonies for at least three days prior to their being used for cell-rearing purposes is a detail that must not be overlooked or under-rated.

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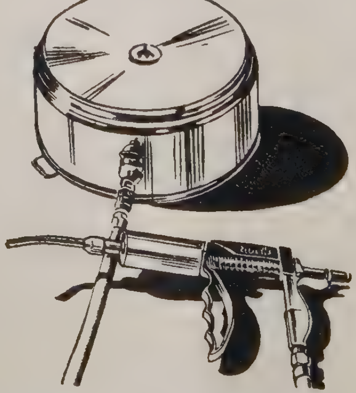

Save time — stop wastage — give accurately measured doses from 5 c.c. to 1 fluid oz. Complete with Container, Rubber Tubing, Straps, Cock and Carrying Case, £6/15/-.

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# Pasture Establishment

*By* E. M. BATES, *Instructor in Agriculture, Alexandra.*

**NEW Zealand's exportable wealth is derived principally from grasslands, and establishment and management of pasture are of vital importance to the farming industry and the prosperity of the Dominion. Recent research developments and the outstanding results obtained by isolated farmers under a variety of conditions in different localities give some indication of the potentialities of grassland along sound lines of development.**

DUE principally to climate, farming in the North Island of New Zealand differs from farming in the South. The North Island is pre-eminently suited to grassland farming, the South Island to rotational pastures and arable crops, with the alternative of permanent grasses of comparatively low production. There are, however, some 14,000,000 acres of hill country mainly in native tussock grasses.

The North Island grasslands may be divided broadly into two main classes:

1. A relatively small proportion of the total area is capable of holding high-producing permanent species, which in the humid climate have a long seasonal growth range and high carrying capacity. Soils are either naturally fertile or fertility has been built up to ryegrass-white clover standards by highly-efficient management and topdressing. Probably an additional million acres at present dominantly browntop, rushes, sweet vernal, and other weeds are potential ryegrass-white clover swards under better exploitation, such as adequate drainage, topdressing, and management.

2. The greater proportion of the North Island consists of unploughable hill country brought in from forest and scrub. Because of lower fertility, existing pastures are in various transitional stages towards stable associations of low-producing grasses and clovers. Danthonia and browntop are the dominant species under drier and wetter conditions respectively. An appreciable change in fertility affects the composition of the sward. Building up fertility for example on a danthonia sward can do little to increase the limited growth of this species, but promotes development and dominance of stronger growing, more useful pasture plants. On light country such a fertility change may follow a good take of autumn-sown subterranean clover stimulated by phosphatic topdressing through stock. Frequently better species are surviving in the poorer pastures without making appreciable growth until fertility is raised, but in some cases broadcasting of additional seed may be warranted.

## *Time of Sowing*

In the more humid districts long-rotation and permanent pastures are usually autumn sown. Wet conditions and weed growth make establishment more difficult in the spring, especially on heavier land. During autumn the ground is drier and warmer, competition from weeds is less, and in the north particularly the relatively mild winter conditions give little check to autumn-sown pasture. Permanent pasture in the North Island is frequently sown after oats, a rotation which, although not ideal, permits early autumn sowing.

Following summer forage crops such as rape and turnips a seed-bed often cannot be prepared until towards the end of April. In districts with ample rain early February sowings may be satisfactory, but they are risky in drier localities. In colder districts the extra time for establishment before winter is an advantage. Late February-early March is generally considered the optimum period of sowing in many parts of the Dominion.

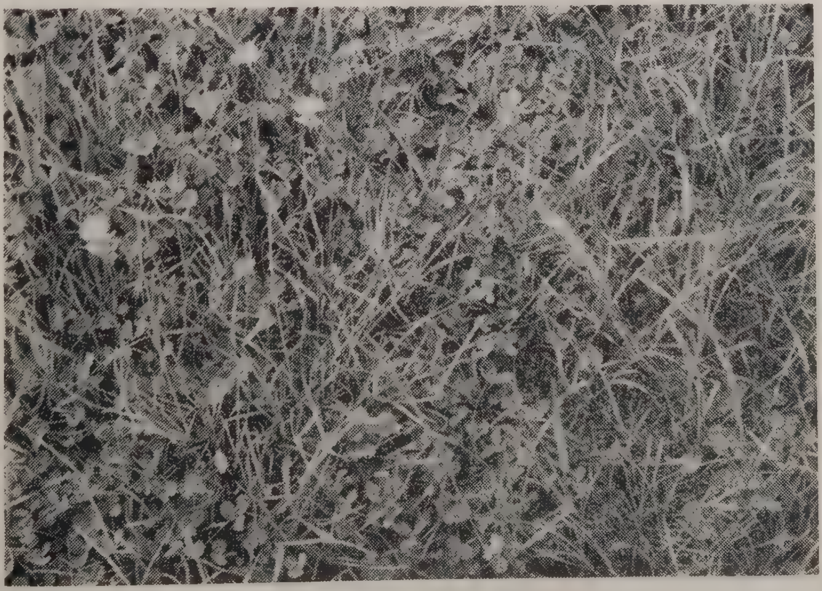
Short-rotation pastures in arable farming districts of the South Island are generally sown in spring, as they are then more suitably fitted in with annual cover, cash, or fodder crops grown in the rotations.

In the cropping districts of the South Island early autumn conditions are usually too dry for good pasture establishment, and in any case the ground is generally occupied with crops at this time. Late-sown pastures on the other hand are liable to severe frost-lift damage and complete failure of clovers. The most satisfactory autumn sowing for long-rotation pasture follows spring ploughing and summer fallowing to conserve moisture and promote a mellow tilth.

A partial failure is not uncommon when sowing down after a cereal stubble, when the soil is less fertile, often dried out, and difficult to cultivate until late in the season before rain softens the hard ground.

## *Sowing*

For the critical period of pasture establishment conditions must be made as favourable as possible. The seed-bed should be fine and firm from top to bottom. On cultivated ground seed and fertiliser are usually broadcast on a Cambridge-rolled surface. A stroke with light grass harrows is sufficient to cover the seed. Broadcasting of permanent pasture seed gives the best ground cover and is general on heavier and medium lands. On light soil, and especially in dry localities, where the seed-bed is not entirely satisfactory for broadcasting, seed and fertiliser are sometimes lightly drilled. Drilling ensures a more certain germination and stronger development, but ground



A first-class pasture on tarry soil near Oamaru.

cover is poorer with better opportunity for weeds to develop between the drills. Further preparation of the seed-bed and later broadcasting may be the best procedure, unless the season is well advanced.

With bush-burn sowings, where no preparation of a seed-bed or covering of seed apart from ash is possible, advantage must be taken of favourable conditions for burning and sowing. Successful burns, suitable grass seed mixtures, and good strikes are important factors in reducing second-growth invasion and erosion losses.

## *Cover Crops*

With a few exceptions, permanent pasture should not be sown with a cover crop such as oats or rape, which is apt to smother establishing pasture plants, especially on heavy land. Permanent injury to the sward and reduced production throughout the life of the pasture frequently result from this practice. Early grazing to control the cover crop may injure the young pasture, especially under wet conditions on ground liable to poach. If stocking is delayed until soil conditions are better, weed smother may result, leaving the pasture weak and open. In Southland and certain other districts spurrey often invades autumn-sown pastures and a greenfeed cereal is sometimes grown as a cover crop to repress this weed. However, even ryegrass is repressed by a cereal.

Second growth after a poor burn and weak pasture establishment on the east coast, North Island.

## *Seed Mixtures*

In permanent pasture sowings the ultimate association of pasture species which will form the sward should determine the constitution of the seed mixture. Where ryegrass and white clover become dominant they may be the only species sown. With the more lenient grazing management general on dairy farms, grasses such as cocksfoot, Yorkshire fog, and meadow foxtail usually increase in the swards. This also applies to paspalum in the northerly districts. If allowed to grow unchecked in summer and autumn, paspalum will tend to smother ryegrass and white clover, and a sod-bound condition will ultimately result. If kept in check by grazing, assisted if necessary by mowing and stimulated by topdressing, paspalum-ryegrass-white clover swards are capable of the highest production.

In the preparation of seed mixtures for soils of lower fertility the best of the low-producing species should be included, as they will become dominant in the sward should fertility fall below that required for the more productive grasses and clovers. This may be anticipated for a bush-burn sowing or on poorer ploughed land where the fertility liberated by cultivation cannot be maintained. Within climatic and economic limitations, the modern practice is to induce soil conditions suitable to the higher-producing pasture plants, and to simplify seed mixtures accordingly.

**Good strains of seed with high purity and germination should always be sown. Especially with ryegrass, white clover, and Montgomery red clover, strain is important to the future welfare of the pasture. When seed production is contemplated, the best strains of Certified lines such as Government Stock and Pedigree seed should be sown, but for general grazing purposes "standard" (or, as they have previously been termed "permanent pasture") Certified lines are sufficient.**

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In the limited areas where pastures become ryegrass-white clover swards, the seed mixture may be as follows:

| | lb. per acre. |
|---|---|
| Certified perennial ryegrass | 40 |
| Certified white clover | 2 |
| | 42lb. |

A similar but usually reduced seeding of ryegrass is also used for seed production in special areas.

A typical seed mixture for high-producing fattening or dairy pastures on well-drained, ploughable land is as follows:

| | lb. per acre. |
|---|---|
| Certified Italian ryegrass | 5 |
| " perennial ryegrass | 20 |
| " cocksfoot | 8 |
| " white clover | 2 |
| " Montgomery red clover | 2 |
| " broad red clover | 1 |
| | 38lb. |

In warmer northerly districts where paspalum thrives cocksfoot could be replaced by paspalum. In the south where crested dogstail and also timothy in wetter situations are useful constituents the Italian ryegrass in the above mixture could be replaced by 3lb. per acre of dogstail and 2lb. per acre of timothy, while cocksfoot could be increased to 12lb. per acre.

Fertility is frequently low after second-growth burns, and some adaptation of the following mixture may be required to suit conditions of fertility:

| | lb. per acre. |
|---|---|
| Browntop | 3 |
| *Danthonia pilosa* | 2 |
| Crested dogstail | 3 |
| *Poa pratensis* | 1 |
| *Lotus major* | 1 |
| Certified white clover | 1 |
| Certified perennial ryegrass | 8 |
| | 19lb. |

## CERTIFIED "STANDARD" SEED

IN the past the term "Permanent Pasture" has been used to name the lowest class of Certified grass and clover seeds, except in the case of Italian ryegrass, where the term "Commercial" has been used.

**In order to introduce uniformity through all varieties of Certified grass and clover seeds it has been decided that, commencing with the coming harvest, the description "Standard" will be used to identify all grass and clover seeds certified in the lowest class, thus replacing the two names used in the past (i.e. "Permanent Pasture" and "Commercial").**

For some little time a certain quantity of seed may still be marketed bearing tags carrying one or other of these latter names, but as this seed is disposed of the term "Standard" will become universally used.

In the meantime farmers and merchants are assured that the alteration is one of name only, and the terms Certified Standard and Certified Permanent Pasture or Commercial are for all practical purposes synonymous.

*—J. H. CLARIDGE, Agronomist, Wellington.*

Patchy establishment as the result of uneven broadcasting after flooding in Poverty Bay.

Subterranean clover at 2lb. per acre should be included where topdressing will be carried out.

SHORT-ROTATION PASTURES, 2 TO 3 YEARS.

| | lb. per acre. |
|---|---|
| Italian ryegrass | 15 |
| Perennial ryegrass | 15 |
| White clover | 2 |
| Broad red clover | 4 |
| | 36lb. |

H1 ryegrass when available in quantity should prove a useful type for short-rotation pasture sowings.

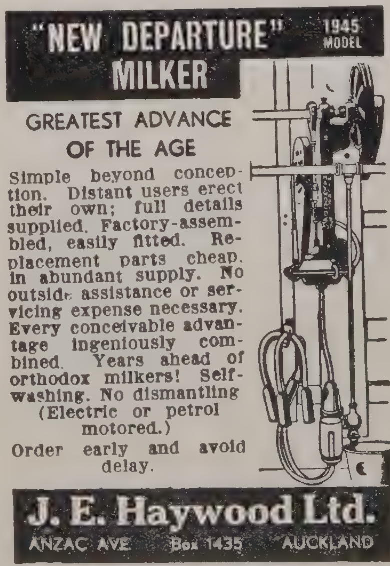
TEMPORARY PASTURE.

| | lb. per acre. |
|---|---|
| Italian ryegrass | 25 |
| Broad red clover | 6 |
| | 31lb. |

All seed should be bought on purity and germination certificate, while by buying Government Certified seed a good strain is guaranteed.

In the early stages of pasture establishment much will depend on early growth that will permit early stocking. Developing swards are frequently handicapped by not stocking early enough. A short, rapid grazing with a relatively high stock concentration will reduce the smothering effect of the more vigorous early species, encourage tillering, and reduce weed competition. Thirty or more sheep per acre provide the even grazing, urine, droppings, and consolidation essential to vigorous establishment and sward formation. Controlled intermittent grazing with high stock concentration and avoidance of over-grazing or over-maturity of growth are major factors in development of vigorous, even swards. The same control is more difficult and less practicable with extensive hill-country sowings, although basically the same principles apply.

**Pasture transitions are largely dependent on the grazing management technique. The greater the number of stock that can be carried adequately, the better and more productive grasslands become. The more uniform the grazing, the greater the effect of evening up soil fertility through the stock, with reduction in complexity of species making up the sward.**



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***Now is the time to decide what areas are to be sown to grass this autumn, and now is the time to plan early cultivation work with the object of obtaining that fine but firm seed-bed.***

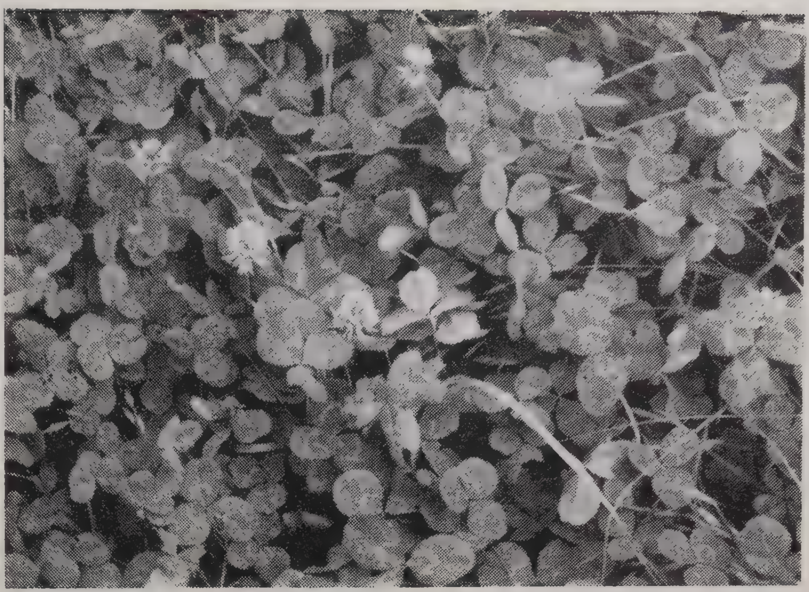
Early cultivation should be deep and thorough, finishing off just before sowing with the use of a light harrow and the roller.

***Time spent in cultivation returns handsome dividends.***

# Topdressing of Pastures

*By* E. M. BATES, *Instructor in Agriculture, Alexandra.*

THE continuation of wartime topdressing difficulties makes it essential for the fertiliser ration to be used to best advantage for autumn topdressing of pastures. The topdressing programme, while varying considerably according to the farming system and the state of the pastures, should be based on certain general principles.



Topdressing stimulates clovers, the prolific growth of which results in greater accumulation of nitrogen.

SOME priority should be given to young pastures, and the better pastures at least should be maintained. This is preferable to topdressing run-out pastures which, on ploughable land, could be more profitably resown. With a reasonably distributed rainfall or under irrigation, relatively poor grasslands have been renewed with good pasture strains, built up in fertility with topdressing and stock manipulation to hold first-class pastures for an indefinite period. Poor pasture strains, incapable of high production, are often short-lived.

The principle underlying topdressing is the use of phosphate to stimulate clover growth. Improvement in pastures from phosphate is through the clovers in the first place. On light land this may be subterranean clover, or, under better conditions, white and Montgomery red clovers.

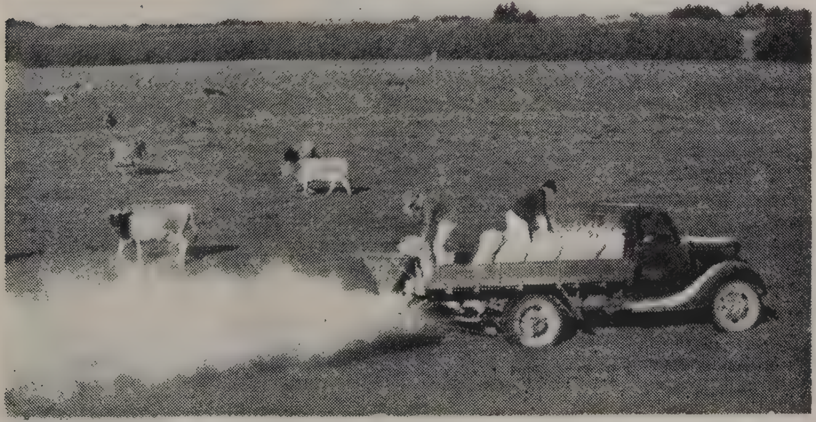
Prolific growth of clovers results in a greater accumulation of nitrogen in the soil and also in a higher carrying capacity with a corresponding increase in animal droppings. Just as phosphate is essential to clover growth so is nitrogen essential to vigorous grass production. Stock nitrogen is in a form readily assimilated by plants, provided distribution is satisfactory. Waste of this valuable natural fertiliser occurs through neglecting to spread droppings by harrowing, and failing to distribute shed sweepings over the paddocks.

## *Time of Application*

Winter and early spring pasture growth is induced by topdressing in late summer and early autumn. If the weather is dry the fertiliser will not be effective until the warm autumn rains encourage new growth. By feeding the plants while they are growing or are about to make growth, pasture can obtain greater benefit from the topdressing. The longer the manuring is delayed, the less there will be of the winter-early spring growth. Feed production in this period of shortage is obviously of far greater value than stimulation of the spring flush growth which results from a mid-winter application.

## *Quantities*

Dressings, which may vary considerably in quantity, are now restricted by rationing. From 2 to 3cwt.



Topdressing with superphosphate.

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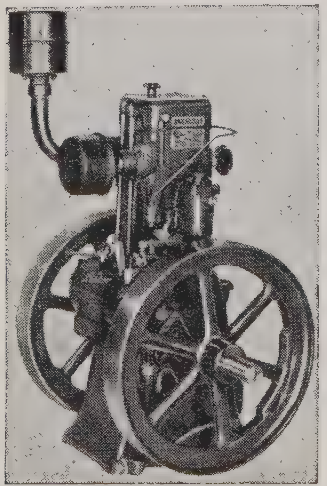

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Topdressing comparisons at Ruatoria. In outside strip, topdressed with superphosphate, ratstail has been replaced by ryegrass and clovers. Inside strip, unmanured, is mainly in ratstail.

per acre were usually applied before rationing started, but on fat lamb or dairy farms heavier applications were frequently made.

Before topdressing, swards should be examined carefully to decide if existing species are capable of using fertiliser to advantage. In sowing subterranean clover, pastures should not be closely grazed as birds will eat much seed, or destroy seedlings. Sweetness and general condition of soil and pasture are worthy of special attention before topdressing. Pastures should first be evenly grazed and stock droppings spread with a suitable harrow. Where drainage is faulty and conditions sour, useful plants cannot be expected to thrive and fertiliser may be wasted.

Very rich land may show no response to topdressing. To topdress poor land with a low carrying capacity may be uneconomical. Apart from actual pasture responses, topdressing may allow greater flexibility in farming, such as a change-over from store sheep to fat lamb farming in borderline farms.

As the thrift and health of livestock, the monetary values of livestock products, and the residual and secondary effects of topdressing are so closely interlocked, it is difficult to assess the actual value of topdressing. However, there is no doubt that before the best benefits from topdressing can be derived there must be both sound farming practice and stock management.

### *Artificial Fertilisers*

In most soils there is usually an ample supply of the many different elements which are needed as plant food. Cobalt and boron are examples of "minor" or "trace" element deficiencies. Plant foods containing phosphate, nitrogen, and potash constitute the three principal artificial fertilisers.

Available phosphate in New Zealand soils is the most important need of crops and pastures. Most soils contain phosphates sufficient to grow crops for many years, but these phosphates tend to be in an insoluble form in the soil. Unless assisted by artificial phosphates, growth may be restricted.

Under the present rationing scheme, where the phosphate content is relative to superphosphate, 27cwt. of serpentine superphosphate is regarded as equal to 20cwt. of superphosphate. On a weight-for-weight basis in trials, these fertilisers have given results which, although differing very slightly, indicate an advantage in using the serpentine-reverted form to conserve phosphate. Most New Zealand soils contain potash sufficient for ordinary needs. Potash fertilisers generally show no responses, except in certain well-defined areas such as parts of Taranaki, Waihi, and Southland.

The importance in grass production of nitrogen from clovers, stock urine and droppings has been mentioned. It is not sound policy to use artificial nitrogenous fertilisers for topdressing pasture except for special purposes, as for instance, on strong ryegrass swards. Their effect on the pasture, especially in the reduction of clovers in the sward, is often undesirable.

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Here is a palatable, balanced and specially prepared mixture that is easily digested and assimilated; that furnishes desirable ingredients to compensate for **poorness of pasture or any major soil deficiency;** that is invaluable as much in cases of malnutrition as in promoting the growth of young animals.

**Every consignment that leaves our Factories is Guaranteed to contain:—**

Pure Bone Flour
Sulphur
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**FACTORIES AT PALMERSTON NORTH, CHRISTCHURCH AND TE AWAMUTU.**

# Liming of Pastures

**DURING the war the amount of lime carried by the N.Z. Railways steadily increased, reaching a total of 698,000 tons during the 1944-45 season as compared with 393,000 tons in 1939-40. Although this huge increase may have been partly accounted for by some diversion from road transport to rail, there has undoubtedly been a great increase in lime production. The increasing demand has been accentuated by fertiliser rationing, but there has also been a growing realisation of the value of lime, and when fertiliser supplies become normal the high tonnages of lime now being delivered are likely to be maintained in many districts.**

ALTHOUGH there is no particular season for liming, topdressing of grassland with lime generally takes place during autumn and early winter, when harvesting is finished and other seasonal work occupies less attention. By this time pastures have become well grazed and are dry enough to permit lorries or topdressing machinery to operate easily. In mixed farming districts the demand for lime for topdressing during this period does not conflict with cropping requirements. In Otago and Southland, where the importance of lime in agriculture has justified a rationing scheme, lime needed for cropping or for sowing new pastures takes precedence during spring and early summer. This allows lime produced during the remainder of the year to be used for topdressing at a rate of 4cwt. per acre of carbonate of lime. To some this may seem only a small amount, but it does at least allow every farmer to use lime, and ensures that the necessary forage crops, swedes, and turnips have their quota and new grass an allowance of 10cwt. per acre, which is important because the liming of new pastures is a great help to the establishment of clovers. Under such conditions the pasture generally obtains a good start and it can take full advantage of subsequent fertiliser applications without further liming for a number of years.

The length of time lime will last when topdressed on to pasture depends largely on the soil, the rainfall, and the type of lime used. Ground carbonate of lime, also known as agricultural lime, is almost universally used, although where cartage costs are high, quicklime is sometimes obtained. Its caustic nature, ready reaction to moisture, and wide variation in quality of commercial lines are prejudicial factors. A coarse sample of ground carbonate of lime will remain longer near the surface than a fine sample, although the latter will ultimately be more effective. In work carried out at Marton there was no difference in response between a hard limestone and a soft one over a period of six years, nor was there any significant difference between a commercial sample and one which was ground particularly fine. A relatively coarse sample, however, was less effective. Provided ground limestone contains at least 50 per cent. of material passing a 30-mesh screen, it is quite satisfactory for topdressing and the cost of finer grinding is not justified. These experiments also indicated that the duration of effect of an initial lime dressing of 2 tons per acre is marked for at least three to four years, and the loss was between 3 and 4cwt. annually if superphosphate was applied. The application of from 15 to 20cwt. of limestone every three to four years would maintain the lime status of many soils at a satisfactorily high level.

As soils in all regions where the rainfall is greater than the evaporation tend to lose lime and become acid, periodical liming is most necessary in the higher rainfall districts. The need for lime is apparent in North Auckland, Westland, South Otago, and Southland. New soils of comparatively recent volcanic origin in the Bay of Plenty and the central plateau of the North Island have not been subjected to prolonged leaching and show little response to lime. In certain relatively dry districts, however, soils have a fairly high lime requirement, especially if they are open and shingly. Generally, however, with a lower rainfall the lime requirement is reduced.

Where irrigation is practised the lime requirement is likely to increase after a few years. In Canterbury, where trials have shown that liming is generally beneficial to pastures even under normal conditions, lime is likely to be of extreme importance under irrigation.

Irrespective of geographical and climatic factors, the lime requirement of soils depends largely on soil type, and field officers of the Department of Agriculture have carried out numerous trials which indicate those types most in need of liming. Although serving a useful purpose in some soils by being utilised for plant growth, lime is used mainly to neutralise or reduce soil acidity, and "sweeten" the topsoil, and a lime requirement test indicates the approximate amounts of lime per acre required to neutralise soil acidity.

Most plants thrive best when the soil is near a neutral condition but show considerable variations in their acid tolerances. Lime may be applied with certain crops such as lucerne, red clover, sweet clover, sugar beet, and barley, which require fairly neutral conditions and soils well supplied with lime. Lupins, potatoes, browntop, and oats are much more tolerant of acid conditions. Sorrel and sweet vernal, which are acid-tolerant weeds with low fertility requirements, indicate chiefly an impoverished soil and lack of competition from better species.

Soil acidity has an important bearing on many plant diseases. As clubroot is more tolerant of soil acidity than the brassica host plants but is inhibited by an alkaline condition of the soil, liming tends to hold the disease in check. On the other hand potato scab is checked by acidity and liming frequently increases the incidence of the disease.

Other important general functions of lime are improvement of tilth in clay soils and the promotion of nitrification through stimulation of clovers. Plant food is liberated by lime as in the breaking down of organic matter. Phosphates which tend to become insoluble in the soil may be retained in reasonably available forms by lime. In general lime acts as a soil amender; it is not looked on as a fertiliser, nor is it a substitute for fertiliser, drainage, or tillage. If high production is the aim lime is usually used with superphosphate, and only good farming practices can ensure complete results, as lime is only one of the factors contributing to success.

*E. M. BATES, Instructor in Agriculture, Alexandra.*

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# New Citrus Canker Regulations

THE Citrus Canker Regulations, 1945, which came into force on December 6 last, replaced the Citrus Canker Regulations, 1940. The new regulations incorporate several important changes in the control of citrus canker which are summarised as follows:—

1. The former regulations provided for "bare-poling" of trees infected with citrus canker and for payment of compensation for "bare-poling." This method of controlling the spread of citrus canker has proved ineffective and reliance is now placed exclusively on complete destruction of diseased trees and trees exposed to infection by being near to diseased trees.

2. In the 1940 regulations the term "infected" was defined in language wider than in the Orchard and Garden Diseases Act, 1928. The term "infected" which is not defined in the present regulations, bears the same meaning as in the Act.

3. Under the former regulations when citrus canker was found an inspector had authority to order the destruction not only of diseased trees but also of all other trees which, in his opinion, were likely to become diseased because of their proximity to a diseased tree. The present regulations limit the powers of an inspector to order the destruction of trees likely to become diseased to those trees that are within 36ft. from a diseased tree measured from trunk to trunk.

4. If further citrus canker occurs on any land within 12 months after the last outbreak the remaining citrus trees on the land or such number as the inspector specifies may be ordered to be destroyed.

5. Notice to destroy citrus trees must be served on the occupier of the land on which citrus canker is found. If the occupier fails to comply with the notice, the destruction may be carried out by an inspector at the expense of the occupier and the cost incurred by the inspector is chargeable against the amount of compensation for such destruction to which the occupier may be entitled.

6. For computing compensation payable for the destruction of citrus trees under the regulations the limits of assessment of loss are raised for non-bearing trees to from 3/- to 10/- per tree, the maximum figure of 10/- applying to non-bearing trees five years and over from date of planting to date of destruction. For trees in bearing when destroyed the assessments for crop loss range from 10/- to £7 per tree. Assessments of loss are to be made as in the 1940 regulations, but with assessments of crop loss the assessment committee must have regard to the normal effects of citrus canker on cropping capacity if a diseased tree or one exposed to infection had been left growing for the four annual harvests following the date of destruction on which the assessment is based. The fact that a crop from an infected area may not be removed for marketing is to be disregarded in assessing the loss.

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### HOW TO ESTABLISH A CITRUS ORCHARD.

Figures show that there is almost unlimited scope for the production of sweet oranges and some room for expansion in the production of New Zealand grapefruit. Detailed advice on how to establish a citrus orchard consisting of New Zealand grapefruit, sweet oranges, mandarins, or other grapefruit are given in Bulletin No. 206, which is obtainable free from offices of the Department of Agriculture.

# FRUIT GROWERS SHOULD NOT NEGLECT SPRAYING, BUDDING, AND PROPPING

By *A. R. GRAINGER, Orchard Instructor, Christchurch.*

ALTHOUGH as the season advances harvesting, grading, and packing of fruit demand increasing time and attention from growers, operations such as late spraying, budding, and propping should not be neglected.

THIS article deals mainly with the work required to be done in orchards during February. The correct technique of picking fruit is also discussed.

## *Spraying*

February is usually a dry month and red mite (*Paratetranychus pilosus*), unless precautionary measures have already been taken, may develop to the stage when applications of white summer oil (1-100) are necessary.

Precautions against an attack of *Glomerella* (bitter rot) or *Nea fabraea* (ripe spot) should be taken by applying the second spray (Bordeaux 1-2-50) now. Codling moth (*Cydia pomonella*) control must still be considered, and an application of lead arsenate powder, 1½lb. to 100 gallons, is essential on late-maturing varieties, while, with mid-season varieties, such as Jonathan and Delicious, an application of lead arsenate at the same strength the second week in February should suffice. The spray residue problem must be kept in mind. A spray applied a little earlier than it is normally due sometimes gives sufficient protection, and allows the spray residue to weather off the fruit sufficiently by the time it is ready for packing.

Should the dry spell break during the month with rain of considerable duration, black spot of the pin-head type is liable to appear on highly susceptible varieties such as Dougherty, Winter Nelis and, to a lesser extent, Statesman, Rome Beauty, and Sturmer. The spraying problem then becomes more complicated, and often spray residue accumulates. Although black spot infected fruit is undesirable, fruit must also be reasonably free from heavy spray deposit. The situation should be studied very carefully and if necessary the advice of the local Orchard Instructor sought.

## *Sun Scald*

As February is generally the hottest month of the year, apples may be affected by serious sun scald at this time. It will be noticed that fruit is frequently scalded on the uncoloured side which, up till then, has been facing away from the sun. However, because the weight of the fruit bears the branches out towards the horizontal, the tender side becomes exposed and then scalded. The remedy is to wire the limbs securely so that they remain upright.

## *Budding*

Stone fruit growers contemplating changing over some of their apricots, plums, or peaches to other varieties should implement this by budding during February—the latter half of February or early March being the time for peaches. Main rule for budding is that the stock, while nearing the end of its seasonal growth, shall have sap flow left sufficient to assure union with the inserted bud but not to force it into growth.

As buds are inserted into the current season's wood an ample supply of new growth is necessary for reworking the older trees. This is obtained by cutting the stock hard back in the spring. Buds are inserted in the resultant young growth in the late summer or autumn. Bud wood should be obtained from trees the type and cropping abilities of which are known to be good.

**Good type of picking bag.**

[*Department of Internal Affairs photo.*

## *Harvesting*

It is not possible to give an accurate picking schedule for all varieties to cover the whole Dominion; neither is it practicable to fix actual dates in advance owing to variations in climate from year to year. Sometimes a variety intended for long cool storage may have to be harvested before a variety intended for immediate marketing which normally is harvested earlier.

By observations and tests, growers themselves are best qualified to determine when a variety is ready for picking, either for export, cool storage, or immediate marketing.

Jonathan and Delicious are varieties which in some districts are often picked out of order, especially where the grower has large quantities of

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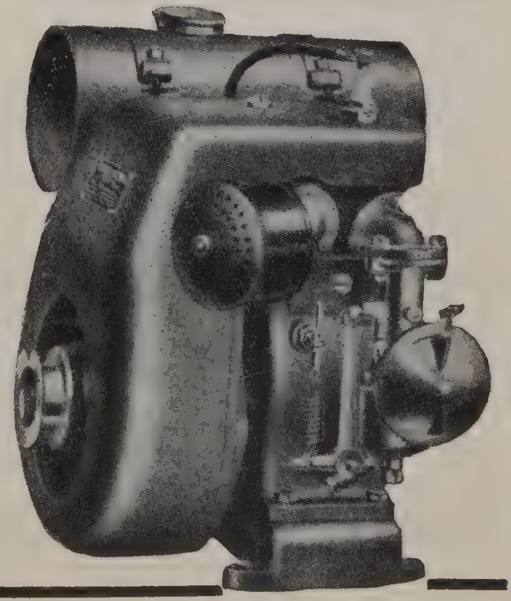
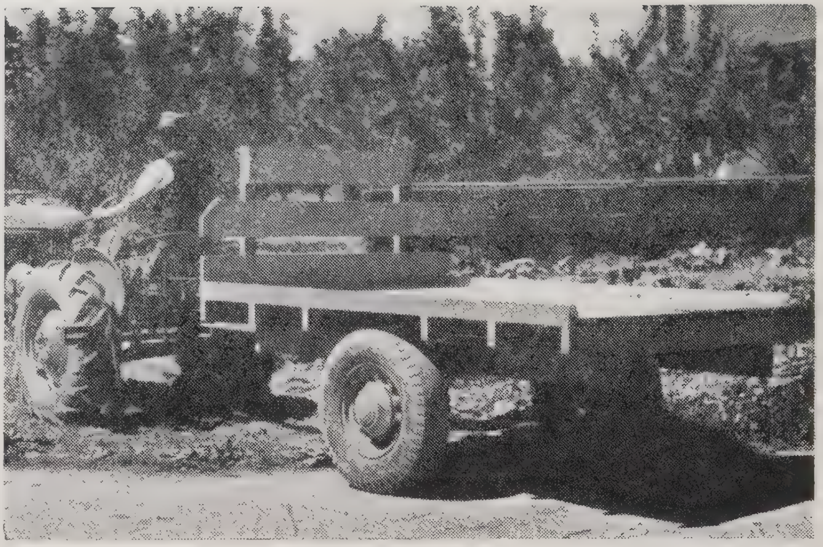


both. Generally, Delicious should be harvested first and packed for long cool storage. Unless needed for export, the Jonathan can remain on the trees a little longer, in order to develop that crisp tree-ripened condition without which this variety is not favoured as a dessert apple.



Suitable trailer for transporting fruit to packing shed.

## *Technique of Picking*

Although fruit picking is a simple operation, inexperienced workers should be taught the correct method and should be carefully supervised until they are accustomed to the work. Fruit should be picked at the right stage of maturity by giving it an upward twist. In this way the stalk is bent over and separated from the spur at the abscission ring. Pulling movements must be avoided, as these are liable to cause breakage of fruit spurs and loss of crop the following season. Fruit should be held in the palm of the hand rather than between the finger and thumb.

## *Equipment*

A good type of ladder was illustrated on page 637 of the December Journal. A range of sizes for use according to the height of the tree being picked is desirable. Picking bags, buckets, or aprons are generally used, although these are not necessary with certain types of low-headed trees, the fruit from which can be handled straight into boxes. Some growers pick with boxes set on the specially made wide top of ladders. Whatever the method used care is necessary in the handling of the fruit which is easily marked or bruised at this time. Damage to fruit often occurs when pickers working on ladders use a bag or apron. In reaching for distant fruit, pressure is applied to fruit already in the bag if the bag remains between picker and ladder.

Orchard boxes may be used permanently as containers for ungraded fruit. Where new boxes are used for picking, the fruit from these can be emptied on to the grading table and the boxes retained in the shed and used for packing.

For transporting fruit from tree to packing shed, a flat top, low set lorry is desirable. The type illustrated is recommended for use as a trailer. Not only can it be manoeuvred readily but it is also suitable for road transport of fruit.

## *Grading Fruit*

Apples and pears need to be graded according to standards prescribed in the New Zealand Grown Fruit Regulations 1940 and amendments, or in accordance with decisions of the Fruit Marketing Council. Details for the coming season are not yet available but fruit growers should get the information from the local Orchard Instructor when it is available.

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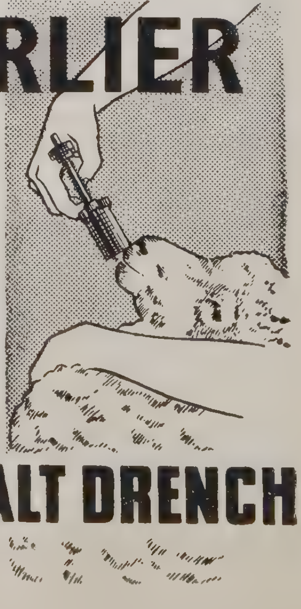

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# Work for February in The Home Garden

*By* D. K. PRITCHARD, *Instructor in Vegetable Culture, Wellington.*

DURING February, the main activities of every home gardener should be directed towards encouraging the development of all vegetable plants intended for late autumn, winter, and early spring consumption. Plants which may have been set out are savoy cabbage (early and late), cauliflower, broccoli, leeks, beetroot, carrots, parsnips, swedes, and tomatoes, as well as salad crops.

At time of writing, indications are that attacks this season on plants of the cabbage family by the larvae of the white butterfly will not be as severe as they have been for the last few years. This is not meant to encourage wishful thinking or laxity in plant protection.

The dry weather usual in February particularly favours the destructive work of aphides on cabbages, etc., and home gardeners are reminded of the aphicidal value of "paranaph," the formula for which is as follows:—

To 1 pint of water add 3½lb. of soap—soft soap is preferred. Simmer over a fire with constant stirring until all lumps have disappeared and a perfectly uniform melt has been obtained. Add 6oz. of naphthalene—refined—and stir until dissolved. Remove from the fire and add 1 pint kerosene. Stir until well mixed. The finished product should be semi-solid, and uniform in texture throughout.

It can be used at various strengths for aphides, scale insects, fleas in buildings, and dogs. It is also a very effective grease soap for cleansing the hands after they have been soiled with oily grease from handling machinery.

The ingredients necessary to make the quantity indicated can be purchased retail for about 4/-, and used at a strength of 2oz. to 1 gallon of water will cost approximately 1d. to 1½d. per gallon. In the home garden it can be used for the destruction of aphides on all members of the cabbage family and other plants affected by this pest.

All the common sucking insects of the aphis type can be readily destroyed with paranaph at a strength of 1 to 1½ per cent. or 5 to 8oz. to 3 gallons of water. Use soft water if possible.

An advantage is that it can be applied at any time of the day, whether there is cloud or bright sunshine.

Watering, too, is necessary during February. Plants should get a thorough soaking. Surface watering induces shallow rooting, and, when the surface soil dries out, roots which have been attracted to the moisture are quickly destroyed.

## *Hoeing*

When hand-hoeing cabbage, cauliflower and other tall-growing green vegetable crops the soil should be gradually drawn towards the stem of the plant. This is particularly necessary with heavy top-growing plants, such as broccoli and Brussels sprouts. Additional soil should be banked on the side of the stem opposite to the prevailing wind. Development of plants such as these is often seriously impaired through high winds breaking surface-feeding rootlets.

## *Tomatoes*

From February, the main work with tomatoes will be spraying, pruning, and keeping plants closely tied to their supports, whether wire or stake. With upright plants, spraying and pruning are more easily and efficiently done. All surplus growth should be removed early as it tends to weaken the vigour of the plant. In addition, by early pruning, the surface exposed to attack by injurious fungi or bacteria is considerably smaller than when shoots are permitted to grow like leaders before being cut out.

Spraying should on no account be neglected. No spray seems less costly and more effective for control of late blight on tomatoes than Bordeaux mixture—preferably home-made with copper sulphate (bluestone) and hydrated lime. Quick changes in weather necessitate efficient spraying at regular intervals of 10 to 14 days. Efficient spraying means covering the under side, as well as the top side, of the leaves with the mixture.

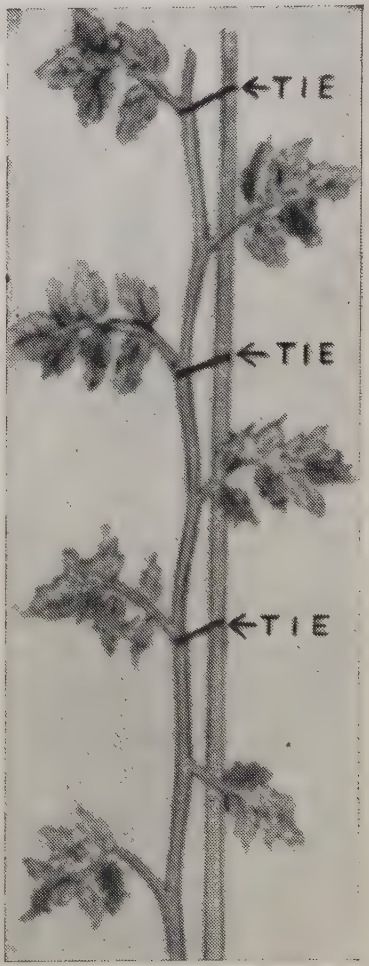
To protect fruit and plant from the ravages of chewing insects, arsenate of lead should be mixed with the spray. For tomatoes, mix arsenate of lead (powder) ½oz. to 1 gallon, in a little water before adding to the mixture. This is a combination spray. When being applied, the utmost care should be taken to see that the stem of the plant as well as the fruit is well covered. Arsenate of lead is a stomach poison for chewing insects.

## *Leeks*

The valuable winter and early spring vegetable, the leek, deserves particular attention. With suitable growing conditions, it will be reasonably well developed before cold weather starts. The plants should be kept entirely clear of weeds as these are serious competitors for soil moisture in dry weather. The soil in which leeks are growing should not be allowed to dry, but good drainage is necessary when heavy watering is made. The soil, which should be kept highly fertile, will be assisted by regular applications of liquid manure. If no animal excreta is available for liquid manure, nitrate of soda may be dissolved—1oz. in 4 gallons of water. Always apply liquid manure after copious watering.

## *Marrows*

During prolonged periods of dry weather the foliage of vegetable marrows is subject to attack by aphides. As soon as these pests are seen on the plants, the leaves should either be dusted with derris or sprayed with an aphicide such as nicotine sulphate or paranaph. Unless intended for stor-



Where to tie tomatoes.

age, fruits should be cut from the plant before reaching maturity.

### *Pumpkins and Squash*

The advice about marrows is applicable to all members of the gourd family. It is suggested, however, that where possible, because of their value as a late winter vegetable, all fruits should be permitted to fully mature before harvesting. This particularly applies to long-keeping varieties.

### *Silver Beet*

February is the best month to transplant silver beet plants so that they may be fairly well grown before their development is hampered by wintry weather. While the soil in which the plants are to be grown should be fertile, inorganic nitrogenous fertilisers cannot be recommended for plants set out in February. Blood and bone manure, which is the safest fertiliser to use at this season, should be applied as a surface dressing at the rate of 2oz. per square yard of the bed. It is best worked into the top soil before setting out the plants. Over-crowding, bad practice at any time, is particularly so in autumn planting. Rows should not be spaced less than 20in. apart and the plants 10 to 12in. in the row. The variety Broad White Rib (dark curled Savoy leaf) is specially recommended.

### *Spring Cabbage*

Seed sowing of cabbage for spring cutting should not be delayed longer than the end of February. Flower of Spring is the main variety grown in the principal vegetable-growing areas in the South Island, and as far north as the centre of the North Island. Further north, for early spring harvesting, a variety of Henderson's Succession is more popular. As this is a drumhead type, plants should not be set as close as those of the smaller pointed head variety.

Good plans and industry will work wonders in the home garden.

### *Rhubarb*

The stalks and leaves of spring and summer varieties of rhubarb will now have completely died down. It will be necessary to give the bed a clean-up to prevent the dormant crowns from being overgrown with weeds which, if permitted to grow, will rob the roots of much needed moisture. Moist soil is necessary for rhubarb root development. Principally during the absence of top growth, the plant food is stored in the rooting system for the next season's crop. Roots should not be transplanted at present.

Other varieties of rhubarb, such as Everbearing, Myatts Victoria, or Crimson Winter, should also be kept clear of weed growth. An application to each crown of two handfuls of blood and bone manure and the same amount of wood ashes would be beneficial. This would provide a reserve of plant food from which the roots would derive the nutrients for the following crop.

### *Carrots*

In northern districts there may still be time to sow seed of a stump-rooted carrot which will be well grown before the cold weather starts. In gardens where the carrot rust-fly is prevalent, there is little danger of the young roots being attacked. Large roots cannot be expected from such a late sowing, but they should be useable. Roots will be more acceptable if free from damage by this soil pest, which in some areas is menacing carrot production.

### *Lettuce*

Lettuce seed may now be sown to obtain plants for setting out as soon as they are fully grown. For this planting, good, rich soil is essential to encourage quick growth. Plants set out in March will develop quickly and can be used over a longer period than if sown earlier. Success is a variety recommended.

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**DON'T** overlook harvesting shallots during February. The bulbs should be removed, left to dry, and then stored in a cool, dry shed.

**DON'T** continue to water onions. Abundant moisture at the roots will induce continued vegetative growth which destroys good-keeping quality.

**DON'T** let potatoes remain on the soil overnight after digging. This practice invites attack by the potato tuber-moth.

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# YOUNG FARMERS' CLUBS

## Granted Special Overseas Bursary

C. B. ("BILL") ANDERSON, a member of the Bulls Y.F.C., whose letters have been an interesting feature of these pages, has been granted a special Overseas Bursary by the Rehabilitation Department. The bursary, tenable in the United Kingdom, will enable him to investigate pure-bred livestock in some of the world-famed studs.

One of the original members of the Bulls Young Farmers' Club, formed in April, 1937, Bill Anderson has performed valuable work for the Y.F.C. movement. He has been secretary and chairman at different times in his own club, and prior to going overseas he was chairman of the Wanganui District Committee for a time. A member also of the Wellington Y.F.C. Council, he served on the Dominion Executive of the Y.F.C. Federation. Always keenly interested in stock-judging, he has been prominent in this sphere, not only in his own district, but also in other parts of the Dominion. He has shown the most success with Southdown sheep and some years before the war he started his own small pure-bred Southdown stud.

### Southdown Breeder

He will be aided by Mr. Arthur Fawkes, of Headcorn, Kent, in his investigations. Mr. Fawkes is a well-known Southdown breeder, and some of his stock have been imported to New Zealand and included in the "Killeymoon" stud at Bulls, the district in which "Bill" Anderson is farming. It is felt that not only will the latter profit considerably by his experience, but that in due course he will be able to apply his greater knowledge to the benefit of stud stock in his district. Close study of animals, such as will be made by "Bill" Anderson, must ultimately lead to improvement of particular breeds in this country.

C. B. ("Bill") Anderson, of the Bulls Y.F.C., who has been granted an Overseas Bursary. This photograph was taken in Rome in October, 1944.

The granting of this bursary brings credit not only to "Bill" Anderson, but also to the Y.F.C. movement. One of the aims of the movement is to bring forward young men fitted for leadership, who will, by their initiative and self-reliance, provide an example for others. "Bill" Anderson, who is one of these young men, will carry with him overseas the best wishes of all fellow Y.F.C. members in New Zealand.

## Fat Lambs

### Manawatu Competition

AMONG the large crowd at the Manawatu and West Coast A. and P. Association's fat lamb competitions at Longburn Freezing Works on December 6 were many young farmers, who took a keen interest in the judging. There were five sections for competition among Y.F.C. members, one between individual clubs, and four among individual club groups.

High appreciation of the standard of fat lambs which came forward for judging "on the hoof" was expressed by the judge, Mr. R. Mitchell, of Wanganui. He stated that he had seen numbers of pens of fat lambs this season at various shows and in similar competitions, but he considered these entries the best. This opinion was supported by the associate judge, Mr. P. Isaac, of Wanganui. Associated with the senior steward, Mr. L. B. Wall, were Messrs. J. F. Knight, S. R. Thomson, and G. M. Moffitt.

Following are the results of the judging "on the hoof" in the Y.F.C. classes:—

C.W.S. Shield, valued at £10 10s. (Group of lambs from any Young Farmers' Club in the Manawatu and Oroua districts not to average more than 36lb. freezing weight): Pohangina Y.F.C. 1, Rongotea Y.F.C. 2, Kairanga Y.F.C. 3, Whakarongo Y.F.C. v.h.c., Feilding Y.F.C. h.c. Five entries in the class.

Individual Y.F.C. groups (three woolly, longwool, or shortwool crossbred, for export, under 36lb): Kairanga Y.F.C.: B. H. Voss 1, A. A. Neilsen 2, Zurcher Bros. 3 (10 entries). Rongotea Y.F.C.: R. O. Gloyn 1 and 3, N. Zajonskowski 2. (9 entries). Whakarongo Y.F.C.: D. J. Lynch 1, J. Oxenham 2 and 3. (6 entries). Feilding Y.F.C.: D. J. Griffin 1 and 3, E. Beazer 2. (6 entries). Pohangina Y.F.C.: P. A. MacDonald 1 and 2, C. Gavin 3. (9 entries).

In the classes not restricted to Y.F.C. members, the following awards were made:—

N.Z. Meat Producers' Board's district competition (three woolly lambs, not over 36lb. freezing weight, quality first consideration): H. A. Stewart (Mt. Stewart) 1, P. A. MacDonald (Pohangina) 2 and 4, Estate of T. O'Neill (Halcombe) 3, K. J. Henson (Sanson) 5, W. S. Fell (Longburn) 6. (73 entries).

## Wairoa Fat Lamb Competition

THE Wairoa Young Farmers' Club's second annual fat lamb competition was held at Messrs. Swifts (N.Z.) Ltd. Freezing Works, Wairoa, on November 22. Entries, which this year were open to land girls, showed an increase of nine pens over last year, 31 pens of lambs, including four from the land girls, being yarded. The whole entry was favourably commented on by the judges, who considered that the lambs generally were of a very high standard taking into account the weather.

The judges were as follows:—

"On the hoof," Mr. Robinson. "On the hooks," Mr. J. Barr (Government Supervising Grader) and Mr. Jackson, of Gisborne.

Results were:—

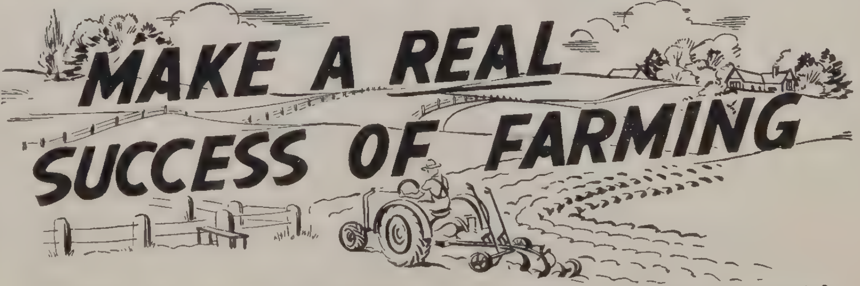
"On the hoof": H. Gray 1, E. Brownlie 2, R. Watson 3. Special prize for land girls, Miss P. Horne.

"On the hooks": R. Watson 1, G. Chapman 2, H. Gray 3. Special prize for land girls, Miss P. Horne.

The prize money was donated by Messrs. M. B. Delatour, E. Brownlie, Torbett, C. O. McKay, H. Bayley, M. Andrew, J. De Gruchy, T. G. Glenny, F. Mardon, N. Walker, F. L. Joblin, J. S. Patterson, and D. Vickers.

Messrs. Swifts provided lunch and afternoon tea and the day closed with the presentation of prizes.

—A. P. RICHMOND, Hon. Secretary,
Wairoa Y.F.C.



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Returned servicemen's competition (three woolly, longwool or shortwool crossbred, for export, exhibitor to have served with the armed forces overseas): P. A. MacDonald 1 and 2, W. J. Gloyn 3. (8 entries).

The carcasses were judged on the following day by Messrs. C. Williamson and W. Wilson, the results being as follows:—

P. A. MacDonald (Pohangina) 1 and 2, B. H. Voss (Kairanga) 3, H. A. Stewart (Mt. Stewart) 4, A. E. Callingham (Stanway) 5, W. S. Fell (Longburn) 6, J. Collis (Kairanga) 7, C. T. Keeble (Kairanga) 8, K. J. Henson (Sanson) 9, Estate of T. O'Neill (Halcombe) 10. These pens will form the Manawatu group to compete in the Meat Board's Dominion competition. The best lamb exhibited was entered by P. A. MacDonald, of the Pohangina Young Farmers' Club. The supervising grader awarded it full marks.

Mr. L. B. Wall (vice-president of the Manawatu and West Coast A. and P. Association), in the absence of the president (Mr. Brian Keiller), presided at the luncheon. In his address he thanked Mr. Moffitt, who contributed largely to the success of the competition. He also thanked Mr. W. E. Wilson, manager of the works, for his co-operation. Mr. Wall expressed pleasure at the participation of the Young Farmers' Clubs, and congratulated P. A. MacDonald on his success in the Y.F.C. competitions and in the open and servicemen's classes. He referred to the support given the competition by the Co-operative Wholesale Society.

Mr. Wilson said it was a matter for congratulation that the fat lamb competition had won widespread support despite a difficult season. The society was pleased to have assisted in reviving the activities of the Manawatu and West Coast A. and P. Association. He added that Mr. Moffitt had the Y.F.C. movement in mind when he began organising the competition. Mr. Wilson said that the society he represented was anxious to help in every way movements which aimed at the production of the highest quality in meat.

Mr. C. Williamson, supervising grader of the Meat Board, expressed pleasure at the interest and active support of the Young Farmers' Clubs in the district and Mr. Moffitt, in speaking of the amount of work involved, mentioned the help both of the Young Farmers' Clubs and the buyers from Longburn and other works.

The C.W.S. Shield for the Young Farmers' Clubs group competition was presented to R. G. Passey, secretary of the Pohangina Club, by Mr. Wall, who congratulated the club upon its success.

# Five Forks Club Has Sports Meeting

THE Five Forks Young Farmers' Club (which has lately resumed its activities) held its first sports meeting on Mr. J. Kingan's property, Black Cap, recently. The event was a great success due to the keenness of club members and the assistance given by local farmers and there was a large gathering of spectators and competitors.

First event was the dog trial (for Y.F.C. members only). Later, various horse events were held, in addition to weight-guessing and chain-stepping competitions.

Results were:—

Dog trials: J. Kingan 1, R. Stott 2.

Horse events.—Jumping: E. Sell 1, C. Kingan 2; ladies' walk: J. Kingan 1, J. Ruddenklau 2; children's trot: R. Kingan 1, J. Ruddenklau 2; Y.F.C. gallop (1st division): S. Bryant 1, D. Frew 2; Y.F.C. gallop (2nd division): J. Kingan 1, W. Sinclair 2; ladies' trot: J. Kingan

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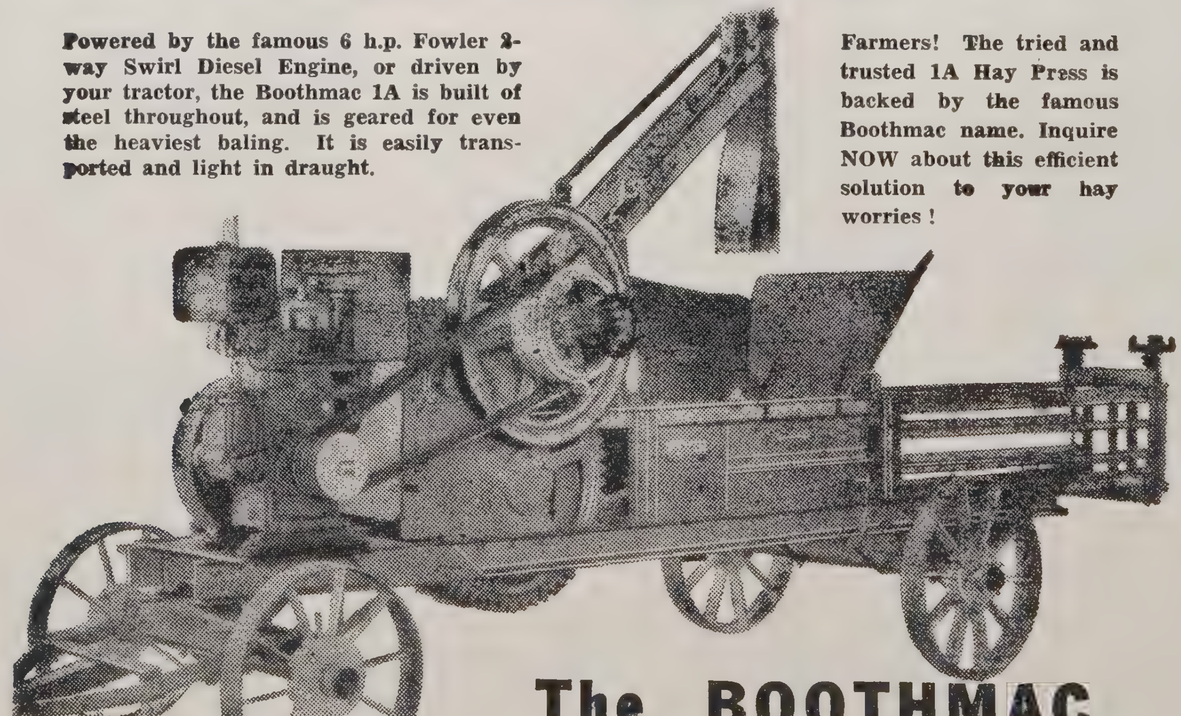

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1, B. Kingan 2; Y.F.C. walk: J. Kingan 1, E. Ruddenklau 2; Y.F.C. walk, trot, and gallop: E. Sell 1, D. Frew 2; children's walk: T. Gibson 1, C. Hacquoil 2; lead and unsaddle: J. Kingan 1, A. Gibson 2; gate opening: C. Kingan 1, E. Sell 2; stock riding: E. Sell 1, E. Ruddenklau 2; children's walk, trot, and gallop: D. Kingan 1, R. Kingan 2; Y.F.C. relay: E. Ruddenklau, R. Scott, C. Kingan, and J. Kingan 1.

Other events.—Chain-stepping: R. Ruddenklau 1; weight-guessing: A. Heron 1.

A dance was held in the evening. Music was supplied by Mr. H. Wilde, with extras by Mr. Searle and Mr. Watson and Mr. Wilde also contributed vocal items. The winners of the Monte Carlo were Mr. A. Gibson and Miss N. Gibson. Mr. J. Kininmont was M.C.

The club chairman (Mr. E. F. Ruddenklau) presented certificates to the successful field day competitors. The profit from the Field Day and dance amounted to £28 13s. 6d. which included a donation of £5 from Mrs. R. S. Mitchell, and over £8 from the raffle of a cake donated by Mrs. Simpson.

The purpose of the field day and dance was to raise funds for the erection of a suitable memorial (in the form of an Honours Board) to club members who served overseas.

—J. F. WILSON, Hon. Secretary,
Five Forks Y.F.C.

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## "Plant Research"— An Address

AN interesting and instructive address, "The Application of Science to the Problems of Primary Production in New Zealand," was delivered to the members of the Franklin Young Farmers' Club by Mr. N. Kirton. Mr. Kirton, who considered the subject too wide to be covered in one address, confined his remarks to one aspect, "Plant Research." He said that never before had farmers to combat the amount of pestilence and disease that now confronted them. Plant Research Stations had accumulated a vast amount of knowledge on these matters, Mr. Kirton said, in stressing that the application of this knowledge lay with the farmers themselves. He considered that the limiting factor in production was plant disease, the direct loss through this now being computed at £7,000,000 annually; the indirect loss added considerably to this figure. Most new diseases were introduced from overseas, in spite of the strictest vigilance and the quarantining of seeds while samples were germinated and tested.

Mr. Kirton, in discussing various crops, indicated the diseases to which they are subject and methods of combating them.

He answered several questions, and was accorded a hearty vote of thanks.

—C. C. UPTON, Hon. Secretary,
Franklin Y.F.C.

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## Calf-feeding

### Winners at Te Awamutu

WINNING groups in the Te Awamutu Club's calf competition were fed as follows:—

D. Hodgson's group of 20 calves (first): For the first three weeks the calves were fed on new milk, beginning with 6lb. daily and increasing to 10lb. They were then gradually changed on to skim-milk with calf meal mixed in. The milk was increased to 2 gal. per day and the meal to 2oz., according to the growth of the calf. All milk was brought to blood heat by adding hot water. The calves when brought in were kept from a week to ten days in a shed. They were then let out during the day and shut up at night until 8 weeks old. At this age they were allowed to run with the cows, at no time being shut up and always getting fresh grass. They were fed in this manner until they were weaned at 5 to 6 months of age.

## *Y.F.C. BADGE COMPETITION*

*A DECISION to supply special badges for the Y.F.C. Dominion president, the vice-president, and past presidents has been made. As the badges will be worn on all possible occasions, the designs must be attractive. For this reason active members are asked to submit designs for all three badges. Prizes of £1 1s. will be awarded for each selected design. Remember, competitors need to submit designs for all three badges, but the designs will be judged separately — Dominion president, vice-president, and past president. A competitor may win £1 1s. with one of the three designs, £2 2s. if two of his designs are approved, or £3 3s. if all his designs are selected. Designs should be drawn to the exact size intended, and competitors should post their entries to the Organising Secretary, Young Farmers' Clubs, Box 112, Palmerston North, no later than February 25, 1946.*

H. Donaldson's group of 8 calves (second): These Jersey-cross calves, born between July 26 and August 28, were selected from dams averaging 368lb. fat in 279 days during the previous season. All the calves were healthy and virile at birth, reflecting the good feeding of their mothers through the winter. When 3 days old each calf was placed in a calf shed to keep it warm and dry and to allow it to forget its mother. After 24 hours' starving the calf was fed on whole milk brought to blood heat with a little hot water. The calves were housed for a week during which they were permanently identified and their horn buds treated with caustic. The ration of milk was gradually increased to 1 gal. per day, plus ½ gal. of hot water, until, when a month old, they were introduced to a proprietary substitute feed paste—a milk extract containing milk sugar 34 per cent., milk salts 13 per cent., milk proteins 18 per cent., and butterfat 1.5 per cent. A whitish brown liquid, it is mixed with water in the proportion of 1lb. of paste to 1 gal. of water. Calves were gradually put on to this feed and there was no difficulty in getting them to take it. At from 6 to 8 weeks of age each calf received daily only 1 gal. of mixed paste and water plus ½ gal. of warm water. The calves were gradually weaned at from 3½ to 4½ months of age. The only case of scouring was quickly cured with castor oil. Hay was always available while the calves were on the bucket. In favourable weather they were grazed during the day in the paddock used by the herd the previous night. The estimated cost of feeding the paste was 18s. 9d. per calf, about half it would have cost to feed on new milk.

D. Ellis's group of calves (third): For the first five days the calves were fed on 3lb. of their mothers' milk twice daily. This was then increased till at 10 days they received 1½ gal. daily. At six weeks of age water and scalded meal were added, till at 8 weeks each feed consisted of 3lb. of milk, 7lb. water, and ½lb. meal. This method of feeding continued until the calves were gradually weaned at about 3½ to 4 months of age. Thereafter they were given abundant change of pasture. The calves always had a clean fresh paddock and plenty of fresh water, but they had no sleeping shed.

—F. E. TURNER, Hon. Secretary,
Te Awamutu Y.F.C.

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## MARLBOROUGH BOYS' AND GIRLS' CLUBS

LAST year the Marlborough Boys' and Girls' Agricultural Clubs resumed operations. The province was divided into four groups—Rai Valley, Havelock, Blenheim, and Ward.

Competitions in gardening, lamb-rearing, and calf-rearing were arranged.

A few schools also had projects in poultry-rearing. Entries for the year were most encouraging and 17 schools participated; 69 calves and 47 lambs were reared, and 30 home gardens and 246 school victory garden plots were cultivated by the children.

The judging days at Rai Valley, Havelock, Spring Creek, and Ward, which were very well attended, roused much enthusiasm. For the championship judging before a large crowd at Awarua Park, Spring Creek, calves and lambs were brought in from all over the province.

Current season entries showed a sharp rise. Calf entries rose from 69 to 139, lamb entries from 47 to 152, and garden entries from 276 to 347. In addition there were 82 entries in other competitions such as poultry-rearing, pig-rearing, and gladioli and sweet pea growing. The number of schools which participated rose from 17 to 30, and an additional group was formed at the Marlborough College Intermediate School.

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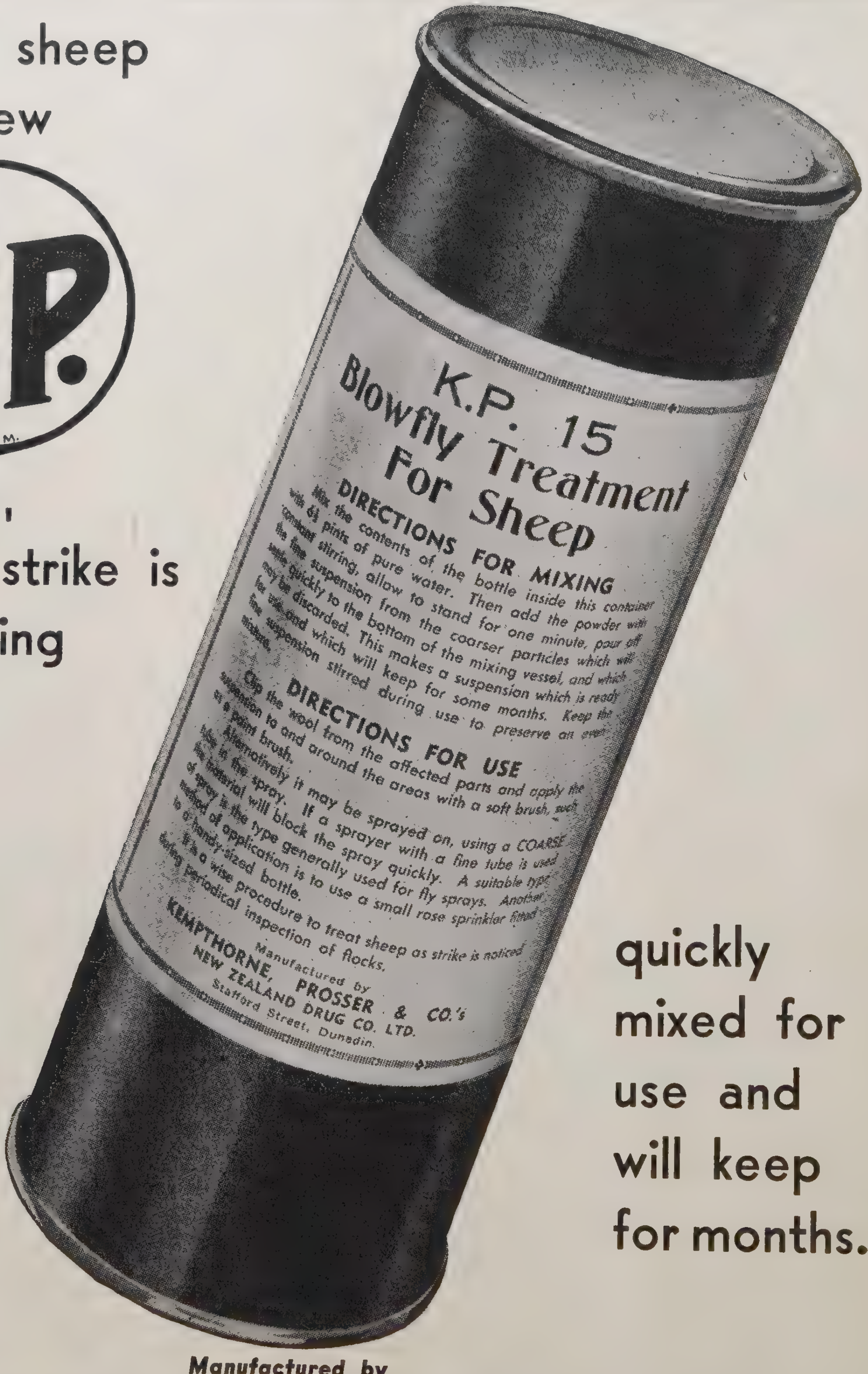
preparation,
as blowfly strike is
noticed during
periodical
inspection
of flocks.


K.P. 15
Blowfly Treatment
For Sheep
DIRECTIONS FOR MIXING
Mix the contents of the bottle inside this container
with 6½ pints of pure water. Then add the powder with
constant stirring, allow to stand for one minute, pour off
the fine suspension from the coarser particles which will
settle quickly to the bottom of the mixing vessel, and which
may be discarded. This makes a suspension which is ready
for use and which will keep for some months. Keep the
fine suspension stirred during use to preserve an even
mixture.
DIRECTIONS FOR USE
Clip the wool from the affected parts and apply the
suspension to and around the areas with a soft brush, such
as a paint brush.
Alternatively it may be sprayed on, using a COARSE
spray. If a sprayer with a fine tube is used
the material will block the spray quickly. A suitable type
of spray is the type generally used for fly sprays. Another
method of application is to use a small rose sprinkler fitted
to a handy-sized bottle.
It is a wise procedure to treat sheep as strike is noticed
during periodical inspection of flocks.
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# Reports on Club Activities

## EASTERN SOUTHLAND

**Southland Technical College Y.F.C.**—Held two club debates. "That the Present-day Farmer Spends too much of his Time away from his Farm." Speakers: Affirmative, A. Edwards, M. Lamb, N. Kock; negative, W. Baird, J. Crombie, W. Cussens. "That the Wireless Provides a Superior Form of Entertainment to the Cinema." Speakers: Affirmative, T. Leonard, A. McKay, D. L. Thomson; negative, D. Crighton, A. Power, B. North.

## DUNEDIN

**Mosgiel D.H.S.**—Field day at Mr. W. Young's farm, Allanton, to view the land under various crops. Mr. Young discussed with members the preparation of the land, the fertilising and sowing, and the after-care of oats grown for horse feed, Cross 7 wheat, potatoes, mangolds, and turnips. He also demonstrated the use of types of tillage implements.

**Otago Boys' High School Y.F.C.**—Newly-formed club with an initial membership of 31. Mr. Gow, of the Department of Agriculture, addressed the meeting on "The Y.F.C. Organisation." Officers elected will be published later.

**Palmerston.**—Arrangements for a combined field day with Dunback Club. Mr. Ivan Smith, a returned serviceman, gave a talk, "Experiences in the Islands."

## NORTH OTAGO

**Enfield.**—Discussion about a club picnic on Boxing Day. Field day trip to Hakataramea Valley arranged. A competition was held on "What Branch of N.Z. Farming has the Best Future and Why?" Talk by Mr. J. Buzan on his travelling experiences in Canada while serving in the Air Force.

**Herbert.**—Arrangements for the club gala. Lecture by Mr. McMann on "Permanent Fencing." Mr. McMann gave a detailed demonstration with models of stays, strainers, gates, and gate-posts.

## MID-CANTERBURY

**Hinds.**—Prepared speech contest: W. Taylor 1, R. Cocks 2, K. McConnell 3. L. Chisnall won the junior contest. Mr. D. Bruce was adjudicator.

**Methven.**—Report on A. and P. Association meeting by C. J. Wilson. Tennis afternoon to be held. Exhibition of films by representatives of International Harvester Co. Twenty members attended a field day at Messrs. Dunkley and Kermodes farm, Winchmore. Mr. G. K. McPherson, Department of Agriculture, gave a talk on the points of pasture-judging. A pasture-judging competition was held in which all Mid-Canterbury clubs took part.

## CHRISTCHURCH

**Ellesmere.**—One new member enrolled. A talk was given by L. C. Coe, a club member, on his experiences as a prisoner of war.

## NORTH CANTERBURY

**Cheviot.**—Final arrangements for field day. Suggestions for Y.F.C. classes at the A. and P. Show. One new member enrolled. Talk on "Air Sea Rescue Work" by Flt. Sgt. V. Williams, recently returned from overseas.

**Oxford.**—"Question and Answers" evening dealing with farm topics.

**Scargill-Omihi.**—Arrangements finalised for dance to be held as a tribute to land girls of the district. Members spoke for three minutes on various subjects, and Mr. Sole gave an address on "Debating."

## MARLBOROUGH

**Flaxbourne.**—Discussion on finance. Presentation to be made to the retiring vice-chairman, who is leaving the district. Mr. H. Cooke, a local dairy farmer, gave a demonstration of milk-testing; with his testing oufit he tested samples of milk brought by members.

## NELSON

**Tapawera.**—Newly-formed club. Officers elected: Advisory president, Mr. F. A. Eden; chairman, M. Savage; secretary, B. Hodgkinson. The district Y.F.C. secretary, Mr. D. Merry, Department of Agriculture, addressed the meeting on "The Aims and Objects of the Y.F.C. Movement." He also explained some slides on "Soil Erosion."

## WESTLAND

**Kokatahi-Koiterangi.**—W. Amberger was elected chairman in place of J. Ritchie, resigned. Preliminary arrangements were made for a sports meeting in March. W. Amberger, A. Little, M. Cropper, and J. Mitchell discussed "That this Particular Land Needs Ploughing in order to Establish Permanent Pastures." A talk, "The Finer Points of a Jersey Cow," was given by Mr. C. Monk.

## HOROWHENUA

**Levin.**—Two new members enrolled. Sub-committee set up to report on the advisability of the club acquiring its own rooms. Discussion on Y.F.C. Memorial held over pending decision of the Dominion Executive Committee on the form that the national memorial should take. A demonstration debate, "The Pick-up Baler v. the Stationary Baler," was held. Speakers, J. Stewart and B. Bartholomew ("Pick-up"), G. Gimblett and R. Speedy ("Stationary"). All took part in a debate "That Co-operative Ownership of Farm Machinery by Three or Four Farmers is More Economical than Individual Ownership." Mr. C. Webb acted as judge in both debates.

## MANAWATU

**Apiti.**—A successful shearing competition was held on November 10. More than 50 were present, including 24 competitors. A full report will be published later.

**Bunnythorpe.**—Report on district committee meeting. Assistant secretary to become secretary. Arrangements made for future lectures. Short addresses given by members as follows: J. Gane ("Sydney"), C. Neylan ("Brazil"), J. O'Brien ("The Atom").

**Pohangina Valley.**—Discussion on the Manawatu district fat lamb competition. One new member enrolled. Decided that, at meetings where there is no lecturer, four members be selected alphabetically to give short talks on any subject they choose. Addresses on their experiences abroad were given by L. Wagstaff and W. Smart. Methods of farming in Italy and Egypt were well portrayed by the speakers. At an earlier meeting the Y.F.C. Memorial and Lincoln College Scholarship were discussed. In the absence of a lecturer, a "quiz" session was held, three members being selected to reply to questions, which led to discussions on farming topics generally. A parents' and friends' evening with motion pictures, supper, and several dances was held. The films which were exhibited by Mr. A. V. Lithgow, Department of Agriculture, assisted by Mr. Ivan Tabor, chairman of the Whakarongo Club, dealt with subjects such as oil pipe-line laying and dehydration.

**Rongotea.**—Business meeting. Social committee to arrange a function in support of the local R.S.A. Queen Carnival.

**Whakarongo.**—Discussion on the Manawatu district fat lamb competition. Three entries received. Prizes of 10/- and 5/- respectively donated by E. Johansen and D. Astwood for the best collection of vegetables exhibited by a young farmer at the Womens' Institute flower show. Interesting talk on "Farm Shelter" by the vice-chairman, J. Spall.

## WANGANUI

**Bulls.**—A large crowd enjoyed a successful Victory Ball held by the Bulls Club to raise money for the National Y.F.C. Memorial, the funds being assisted by a donation of £25.

**Marton.**—Discussion on the request from the Marton A. and P. Association for judges' assistants and class stewards for the annual show. Team congratulated on winning the district debating contest. The Rangitikei Catchment Board asked whether members wanted copies of periodical bulletins issued by the Soil Conservation and Rivers Control Council. Decided to hold a gymkhana on Anniversary Day to raise funds for the National Y.F.C. Memorial. Discussion on the Y.F.C. Show to be held at Feilding. Programme of films from the National Film Library: "Life Cycle of Plants," "Story of a Disturbance," "They Met in London," "Reviews Nos. 103 and 90," "Fighter Pilot," "First Principles of Compression Ignition Engine," "Review No. 148," and "First Principles of Lubrication."

## SOUTH TARANAKI

**Pihama.**—Discussion on future activities. Arrangements for a dance. Talk on "Stock and Their Ailments" by Mr. A. Leslie, veterinarian, Eltham. At the previous meeting the club was addressed by Mr. J. E. Davies, district Y.F.C. secretary, on "Aims and Objects of the Y.F.C. Movement."

## CENTRAL TARANAKI

**Bird Road.**—Dance to be held in Stratford Town Hall. Address by Mr. Fearn, a local veterinarian, on "The Feeding of Farm Animals." The speaker, in comparing hand feeding with pasture feeding, dealt with the advantages of food concentrates.

**Toko.**—One new member enrolled. Arrangements for a visit to Waitotara Freezing Works. Members engaged in impromptu speeches and general discussion.

## NORTH TARANAKI

**Mangamahoe.**—Business meeting. Report on district committee meeting held at New Plymouth. Arrangements to be made for a visit to fertiliser works at Smart Road.

**Oakura.**—Newly-formed club. Officers elected: Advisory president, Mr. F. B. Blundell; chairman, M. Radford; secretary and treasurer, D. Smith.

**Omata.**—Decided to hold a dance. Collection of club subscriptions arranged. Debate, "That Tractors are Better than Horses on a Farm"; speakers, J. H. Thomas and F. Jordan (affirmative), F. Beresford and I. Kurth (negative).

**Tikorangi.**—Discussion on Y.F.C. Memorial and Land Settlement Schemes. Impromptu debate, "Sheep Farming v. Dairy Farming."

**Urenui.**—This club recently resumed activities. Officers elected: Advisory president, Mr. E. Maxted; chairman, J. Davidson; secretary and treasurer, J. Sultzberger.

## CENTRAL HAWKE'S BAY

**Otane.**—Newly-formed club. Further details may be available later.

**Waipukurau.**—Discussion on prospects of a ploughing match and dog trials in the autumn. Address by Mr. J. P. Ormond, "The N.Z. Meat Board." At a previous meeting Mr. J. Mackie gave an address on "Wool Classing."

## POVERTY BAY

**Gisborne.**—Arrangements for field day at the experimental farm, Manutuke. Stewards selected for the A. and P. Show. Final arrangements for dance at Patutahi. Mr. S. D. Reeves, a member of electoral committee of the N.Z. Meat Board, gave an address on "The Meat Board" and also on "The Wool Board."

## TAUMARUNUI

**Ohura.**—Business meeting. Election of delegates to the district committee. Shearing field day postponed owing to bad weather. A social committee was set up. Dance to be held to raise funds for the club.

## TE KUITI

**Otorohanga.**—Combined meeting with the Paewhenua and Te Anga Clubs. The meeting was addressed by the Dominion organising secretary, Mr. S. Freeman, on the progress and future of the Y.F.C. movement. Mr. Freeman also exhibited some sound films.

## WAIKATO

**Cambridge.**—Discussion on the proposed Agricultural High School. Lantern lecture by Mr. Neilsen, Advisory Officer, N.Z. Dairy Board, on "Herd Improvement."

**Elstow.**—Newly-formed club. Officers elected: Advisory president, Mr. H. S. Slembridge; chairman, L. Strange; secretary, S. E. Mackinder; treasurer, L. Hooper. Prospects for this club, which is understood to be a revival of the old Te Aroha Club, appear good. A general discussion on future activities, largely based on information and suggestions from the district Y.F.C. secretary, Mr. J. R. Murray, was held.

**Hinuera.**—Statement of finance. Nomination of trustees to operate Post Office Savings Bank account. Lecture by Mr. A. Crabb, local Inspector of Stock, "Common Diseases in Stock."

**Ngarua.**—Business meeting. Arrangements for table-tennis. Report on cow-judging competition held by the club in conjunction with the Primary Schools' Calf Club activities.

**Okoroire.**—Discussion on district competitions, field days, and other activities. Mr. Fitzgerald, Matamata County Engineer, gave demonstrations on the uses and tying of knots.

**Springdale.**—Address by Mr. Palliser, supplementing a previous address, "How to Conduct a Meeting."

**Te Awamutu.**—Arrangements for a club dinner. Address by Mr. Whittleston of Ruakura Animal Research Station, on "Milking Machine Maintenance."

**Te Pahu.**—Report on recent meeting of the Waikato District Y.F.C. Committee. Suggestions for district activities to be sent to the district committee. Lantern lecture by Mr. T. E. Rodda, Department of Agriculture, on "Silage-making and Hay-baling."

**Waerenga.**—Newly-formed club. Officers elected: Advisory president, Mr. W. J. Jefferies; chairman, K. Keith; secretary, D. J. Hall; treasurer, L. Holt. Mr. Weir gave an address on "Pedigree Dairy Cattle." The club has good prospects.

## WESTERN BAY OF PLENTY

**Paengaroa.**—Discussion on the proposed Agricultural High School in the South Auckland district. Results of the silage competition for the Doidge Cup: B. Gordon, Pukehina (82 points) 1, H. Walker, Paengaroa (81½) 2, C. Butler, Omokoroa (81) 3. Mr. McCarthy, manager of the Bay of Plenty Dairy Association, in addressing the meeting on "Feed Flavours in Cream," stressed the necessity for cleanliness in the milking shed, and described the process in the factory.

**Te Puke.**—Mr. Alan Gordon gave lecture on "Soil Chemistry and the Relation of Bacteria to Plant Life."

**Te Puna.**—Business meeting. Arrangements for future activities.

## EASTERN BAY OF PLENTY

**Thornton.**—Field day on Mr. A. H. Adams's property, Thornton. Demonstrations were given in blade shearing (Mr. C. Smith), machine shearing (Mr. W. Arbuckle), stock-judging (Mr. N. Carter).

**Waimana.**—Lecture by Mr. H. C. White on "The Type of Pig Required for the Bacon Market."

## AUCKLAND

**Clevedon.**—Arrangements for a field day at Alton Lodge, Te Kauwhata. Report on recent club dance, which showed profit of £11 9s. 3d. Remit to district committee suggesting that arrangements be made for North and South Island clubs to interchange visits during the winter. Two new members enrolled. Debate between the Farmers' Union and the club. Subject, "That Freehold Farming is Preferable to Lease-hold." Speakers: Farmers' Union (affirmative), A. Allen, D. Renton, and G. Walsh; Y.F.C. (negative), F. Aitchison, A. Smith, and A. Blundell. The club team won by a narrow margin.

**East Tamaki.**—The evening was spent in donating blood for the Auckland Hospital blood bank, experts from the St. John Ambulance and the Auckland Hospital carrying out the work. Satisfaction at the 21 pints of blood obtained was expressed by the doctor in charge, and the donors were thanked for their assistance.

**Harrisville.**—Dance arrangements finalised. Invitation accepted for members to attend a lecture by Mr. Clark on "Pig Husbandry." Address on "Road Making" by Mr. A. C. Bettany, Franklin County Council engineer.

**Karaka.**—Newly-formed club. Officers elected: Advisory president, Mr. A. Vickers; chairman, Austin Walters; secretary, James H. Bothwell; treasurer, Basil Carpenter.

**Pukekohe East.**—Address by Mr. H. R. Denize, Principal District Inspector, Livestock Division, Department of Agriculture, on "Animal Husbandry."

## NORTH AUCKLAND

**Kaukapakapa.**—Discussion on Y.F.C. Memorial. Members favoured co-operation with local committees in a district memorial. Secretary to obtain an opinion from the district committee on the use of sewage for agricultural purposes, following a letter from the Auckland and Suburban Drainage League. Request from the Waitemata Combined Calf Show authorities for the club to appoint three assistant stewards for Show Day. Addresses were given on life in the Mediterranean and Pacific by Messrs. S. McGuire and F. Henley respectively.

◆

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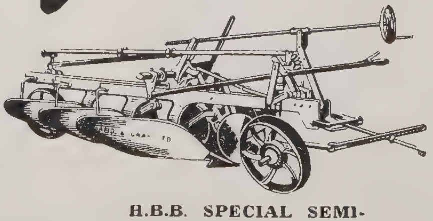

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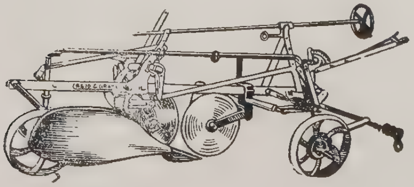

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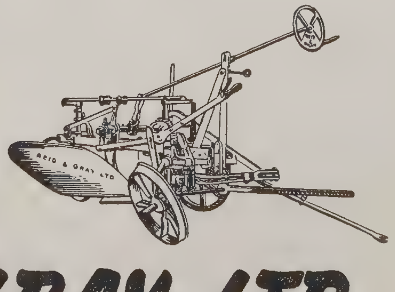

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## THE GOOD NEIGHBOUR

# TWO YEARS LATER

I WONDER how many of my long-memoried Good Neighbours remember the November issue of two years ago, wherein I wrote of a dream that came true? Well, to refresh your memories, and for the benefit too of our newer neighbours, here is a little of what I wrote at that time.

> "How I wish you could all see me at this very instant! For I am sure you would say 'What! Is that her idea of a dream come true?' Well, perhaps it is not all quite true just yet, but the biggest part of it is, and the rest will come. Now take a peep at me: perched on a packing case, with the typewriter on a trestle table that once housed begonias no doubt, suitcases in careless abandon all round the floor, but before me—and here is my dream that has come true—a view that no artist could paint to perfection. Yes, we have shifted, and at last I have what I have always wanted —a room with a view."

And the view is still there, as grand as ever. As I write I can see the shimmering blue of Wellington's harbour on this tranquil morning, and so clear is the air that I can see the golden rim of the beach at Day's Bay shining in the sunshine. And many other sights have I seen from this same window in the past two years: grey, silent ships slipping out in the dull haze of a winter day, carrying a cargo of precious lives to far-off shores; and in recent weeks the glad home-coming of those same ships, bedecked with flags, bringing our loved ones home to us again.

But it is not of the view I want to tell you now—it is of the house itself. So much has happened to our home since we came here two years ago that it is hard to believe it is the same house. It is amazing how quickly and easily a house assimilates the ideas of new owners, and it is of one room in particular that I write now. I have had a photograph of the room taken for you all to share, and my only regret is that I did not have the foresight to have one taken the day we arrived!

Have a glance at the photograph though, and I will tell you that the only thing you would still recognise in this sunlit room that overlooks the harbour is the post in the middle of it!

Unfortunately, because it supports the verandah above, the post had to remain in our scheme of redecoration, but a nail on the post permits it to be turned into a good home for our canary, Petal, when it is too windy and cold for her out of doors; and at night I have seen a coat hanging on that same nail when tiredness is the order of the day.

When we arrived the inner wall of my room was of weatherboard, and the outer wall of concrete. A trestle table ran along the length of the room, beneath the windows, and keeping the post company was a tap. So we set to work, and out came the trestle table, out came the tap, and in came the workmen. Now the woodwork and window sills are painted cream, my walls have been boarded and papered in a sunshiny paper, and where once the ceiling went up to high rafters, there is now a false ceiling, cream to match the walls.

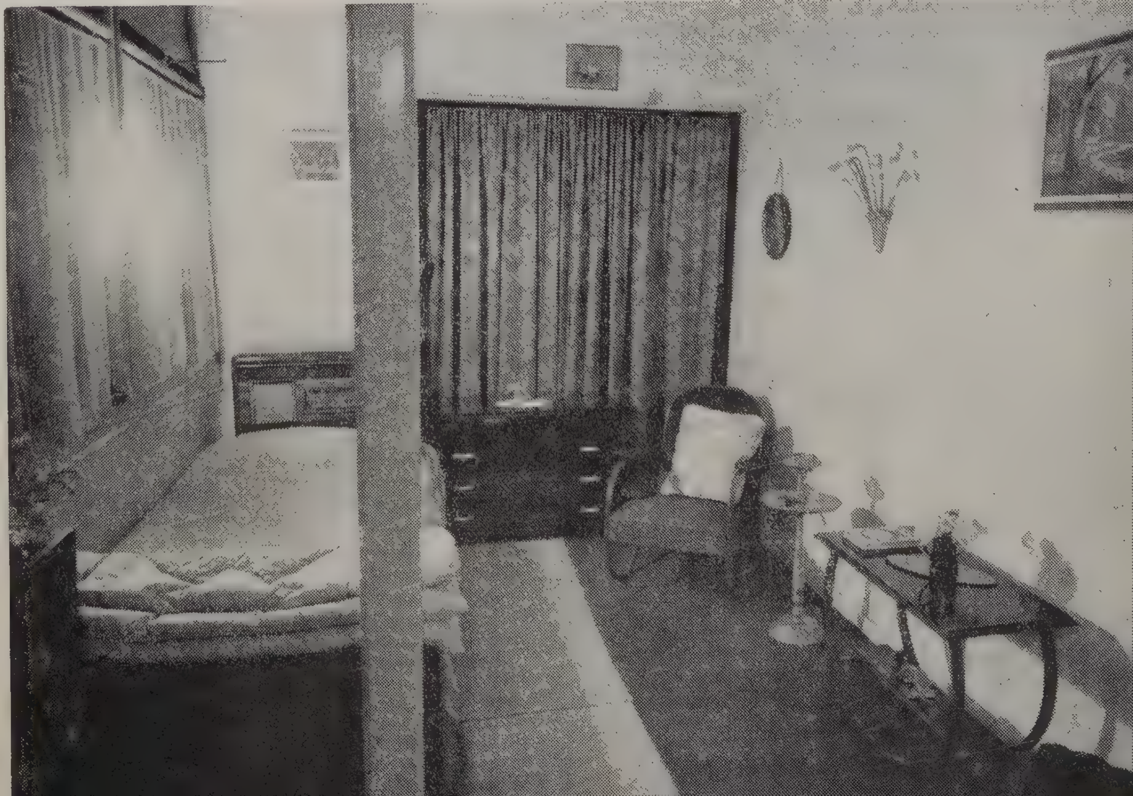
This particular room was lit by soft lamplight when we first came here, but now electricity has been installed, and two unusual wall lamps, one at each end of the room, give a splendid light for writing or reading. The bed was specially made, so that it is a matter of no difficulty for tired hands to turn off the radio when sleep is near; and the glory chest, dark wood, and highly polished, has the advantage of looking really elegant.

To those of you in search of something different in the way of a chest of drawers I can whole-heartedly recommend a glory chest.

There is a comfortable brown easy chair in my room of dreams-come-true, with a footstool handy just for luxury; and the graceful green wall vases—at the moment full of scarlet roses—have the very decided advantage of not blowing over in the wind that so often blows about my windows. The curtains are delicate cream net, dainty enough to give the room that lived-in look, transparent enough to give a clear view of the harbour beyond. And all the tonings are green—the bedspread and eiderdown, the curtain behind the glory chest, the carpet on the floor. Just out of the photograph, at the other end of the room, are the bookcase and the writing desk.

Oh, I could fill a book telling you of the changes we have made in our home, and so much richness we have here I wish you could all take a trip on a magic carpet and have a peep too.

But it is truly said that pleasant surroundings are the first essentials to a contented life, and many indeed are the contented hours I have spent in my room.



# Shady Summer Hats

*HATS for wear while haymaking, or helping with other outdoor farm work, have to serve the useful purpose of a hat, which is to protect the head from the weather, writes Eva Topping, Rural Sociologist, Auckland. Two twists of straw or ribbon, a wisp of veiling, and a feather or flower may make a most charming and exclusive hat for a visit to town or to the races, but wouldn't do for the haymaking, a day's gardening, or a picnic.*

NO, the hat for farm wear has to be a hat and not a frivolous piece of nothing much! It has to be fairly light in weight, but thick enough in the crown to protect the head from some of the fiercest heat of the sun, wide enough to afford protection from painful sunburn to the face and throat and to shade the eyes from glare, while the brim should cover the back of the neck for prevention of sunstroke and kindred troubles. Then, of course, it must stay put. It won't be much use if one hand has to be continually holding it on. And when all these conditions have been fulfilled it ought to contrive to look attractive as well as be useful! Loosely-woven hats imported from the Islands, coarse, inexpensive straws, the cheaper grades of Panamas and other similar lines used to be the answer, but none of these is to be found very often now. Perhaps the directions given here will help to solve the problem this summer.

Cretonnes, imitation linens, cotton prints, haircords, ginghams, and casement cloths are all suitable fabrics for making these hats. Naturally the more fadeless the dye is, the better for this purpose. Inter-linings of stiffened material such as spartrae book muslin or French canvas can now be obtained, and although the brims really need the prepared stiffeners, the crowns can be made without, or well-starched light cotton fabrics would serve and make a satisfactory job. The under-brim material is better made of a colour restful to the eyes—green of a medium shade, blues, and browns all detract from sunglare, while white and very light colours increase it.

### Large-brimmed Sun Hat

The hat needs a little planning, for a paper pattern will be necessary, and to cut it you must have:—

The correct head measurements.

The width the brim is to be.

The line where brim and crown are to be joined.

In materials you will need 1 yard of covering material or ¾ yard of top cover and ¾ yard of contrast, ¾ yard of stiffening such as spartrae for the brim, a piece of millinery or other light wire, and sheets of paper for making the pattern.

### Measuring

Take a piece of fine wire (millinery wire is good and can be obtained again now), and place it round the head where the hat is to fit, and join it at the back (Fig. 1). Put a piece of tape from centre front "A" to centre back "C" over the top of the head. Measure the distance from centre front "A" to crown "C" of head on the tape. This measurement will give the depth required in the crown. Take off the wire ring and measure round, laying it aside carefully to preserve the shape it has taken from the head until the brim is to be cut.

### Making the Pattern—The Crown.

Cut a strip of paper the length of the measurement of the head as indicated by the wire ring, plus 1½in.; as deep as from the centre front of

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In the properly-poised body the head is centred over the chest—the chest is centred over the hips—and the weight falls through the ankle joints. Try and mentally picture that plumb line of balance down through the centre of your body, and translate it into action as you stand or walk.

Try this, whether in motion or standing still: *Be as tall as you can—make the most of your natural height; hold the head high, chin in; chest high and forward, though not aggressively so; abdomen firm and flat; knees slightly relaxed; feet parallel.*

Your internal organs—heart, lungs, and so on—need room if they are to function efficiently. So don't be a slouch.

Remember also that *adequate sleep* and *balanced meals* are prerequisites of an alert and well-held figure.

KEEP THIS ANNOUNCEMENT FOR FUTURE REFERENCE 8b

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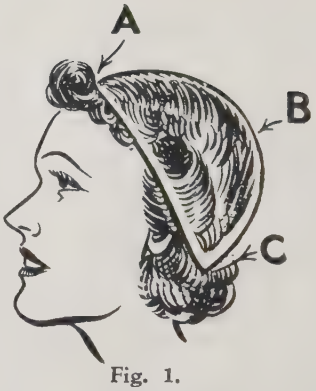
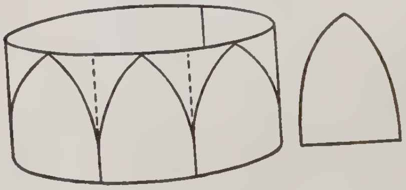


Fig. 1.

head to crown "B" plus 1½in. Join this strip into a ring, overlapping the edges ¾in. Flatten out the paper, then fold into three equally. Shape carefully as shown in Fig. 2, and cut into six pieces. One of these will be the pattern for a section of the crown (Fig. 2a).



Figs. 2 and 2a.

### The Brim

Take up the wire ring and lay it on paper. Pencil around it to give the shape of the head. Now draw lines from back to front, right to left, and again diagonally through the first lines. Mark off the width of the brim required on each line. Draw a curved line to join the points marked, making it flow smoothly so that the brim edge is even. Cut out with a pair of scissors; clip out the centre space leaving ¾in. turning, and snip down at intervals between the turning and the line marking the head size (Fig. 3).

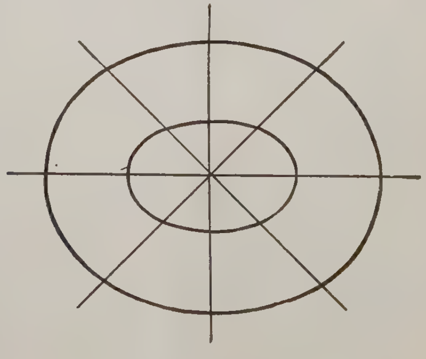


Fig. 3.

### Shaping the Brim

Now you have a flat brim which can be shaped to your liking by making darts from the edge towards the head line, taking care not to alter the size and shape of the head outline. The size and position of the darts will determine the droop and shape of the brim. A "mushroom" shape would need very small darts placed at equal distances all round, while a wide drooping brim might have only one fairly big dart at the centre back. Experiment with your flat brim until you have a pleasing shape which will suit the wearer and of the right width at all points (Fig. 4). With very wide brims you may find that the back has to be made a little narrower than the front, but leave sufficient to shade the back of the neck from the sun. When you are satisfied with the shape, paste the darts down, and pin or tack securely. Now cut from edge of brim to head line at centre back so that the pattern will lie flat on the fabric (Fig. 5).

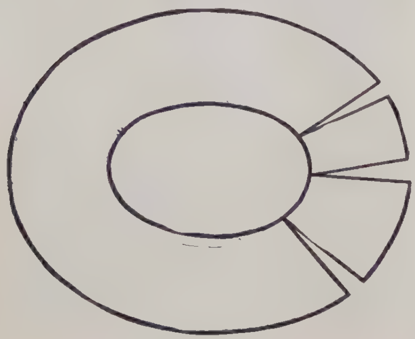


Fig. 4.

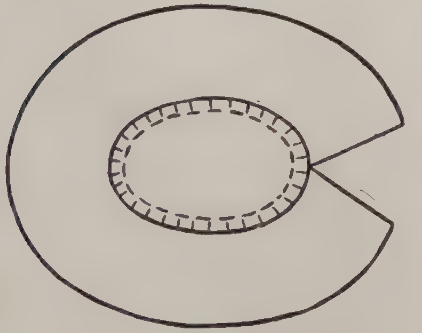


Fig. 5.

### Cutting out in Materials

Mark the centre front of the brim and lay it on the exact cross of the material, cut out, leaving ⅜in. turning on the edge of brim and join, with at least ¾in. on the head curve. Cut six sections for the crown with the base on straight of material and leaving ⅜in. turnings on curved sides.

### Stiffening

Cut out the brim stiffening into the exact size of the brim, leaving no turnings on the outer edge, not less than ¾in. at the head line, and ¼in. on the join. The head section can be interlined with book muslin if you can find it in your shops. If there is none to be had, starch a washed flour or bacon bag very stiffly and use that. Make these sections the same size as the outer covering, that is with turnings of ⅜in. The under-brim, whether of the same material or a contrasting restful colour, must be cut to exactly the same size as the top brim.

### Making Up

Tack interlining sections to crown pieces and join together the six pieces, taking care to make all seams an even ⅜in. in width, so leaving the headline the exact sizes as planned. Join the stiffening by overlapping the raw edges and stitching zig-zag fashion. Trim off raw edges as close as possible to the stitching and press very flat. Stitch brim coverings at the join and press the seams open. Arrange the three layers of material in the right order—pin carefully and then tack securely to prevent any slipping while the brim is stitched. Make rows of tacking stitches round the headline and the outer edge and make zig-zag stitches between to hold the layers very firmly. Now stitch round the outer edge and continue making rows of machine stitching about ¼in. or less apart round the brim. These rows of stitching will keep all three pieces in place, help to stiffen the brim, and keep it in shape. If you are an expert machinist you may wish to vary the stitching by making the rows diagonally like quilting or in some other pattern (Fig. 6).

## Grass

*Smell the scent of sun-warmed grass,*
*Hear it rustle when you pass,*
*See the long stems wild and free,*
*Nod and bend in ecstasy.*
*Nod and bend, bow and shake,*
*Till their slenderness must break.*
*See the pollen golden-yellow,*
*Fall to earth in drifts of mellow*
*Rain. See it drowsing hot and lazy,*
*Its shimmering stalks all gold and hazy—*
*See the lithe wind spin it round*
*Flatten it against the ground,*
*See it rise again—and sigh,*
*Smell its scent when you pass by.*

—Irene J. Street.

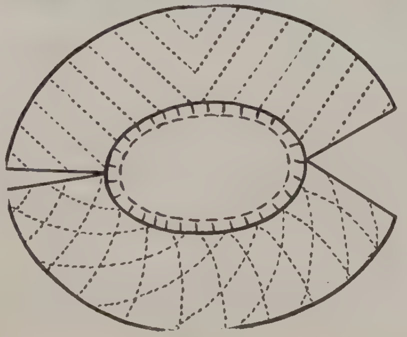


Fig. 6.

Trim the edge of the brim neatly close to the first row of stitching. Cut a bias strip of material about ¾in. wide and long enough to run round the outer edge of the brim. Sew on from the right side, turn under, and stitch again. Try to make the stitching fall just within the binding on the right side—it will then merge into the other stitching, leaving the binding unstitched, and so give a better finish. A thin silk-covered millinery wire can be sewn to the edge before the binding is put on. Cut a length to suit, leaving about 1in. to overlap at the join. Begin at the back of the brim and, holding the wire firmly in the left hand, take short stitches from the top to underside (Fig. 7). Keep the wire on the extreme edge of the brim by putting the needle close to

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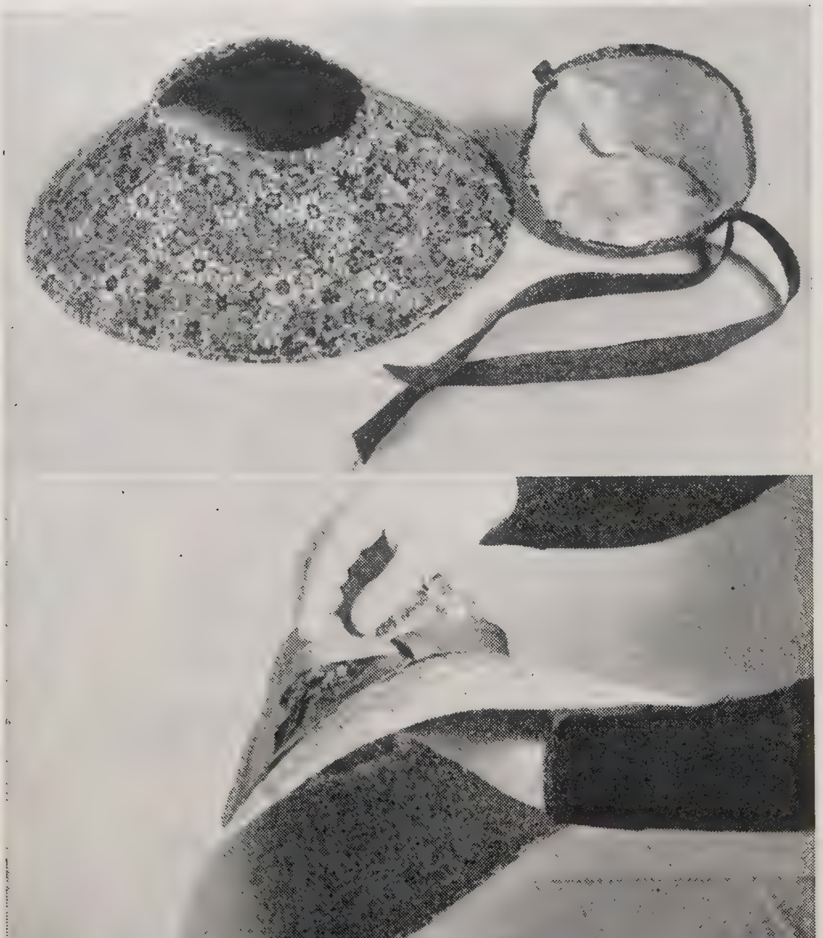
# MAKING UP THE HAT



Upper.—Child's hat in two parts, showing position of fasteners, sections of crown, and lining trimming. Middle.—Child's hat showing crown attached, trimming being put in place. Lower.—The wide-brimmed sun hat showing crown sections, stitching on brim, wired and bound edge of brim.

it and taking short stitches. Make the join strong by working the stitches very close together where the wire overlaps.

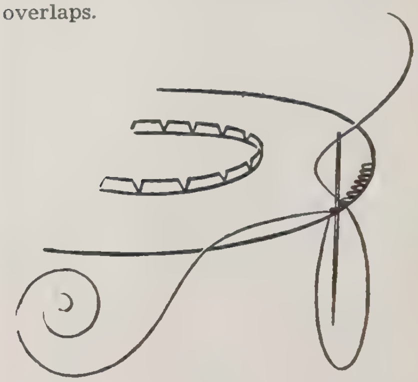


Fig. 7.

Put the crown on the head, place the brim in the desired position, and pin together. You may find that the crown needs cutting away a little at the back to give the hat the correct fit and shape. Turn the crown edge in and stitch over the upstanding clipped edges of the brim.

**Head Lining**

A head lining can be made in sections exactly like the crown or be a "bag" shape. This is made by cutting a circular top piece and a crossway strip of the length of the head measurement and of the width of the crown depth. The crossway strip is seamed together and joined to the top (Fig. 8). The lower edge is turned in and slip-stitched into the crown just below the head line, covering all the clipped raw edges.

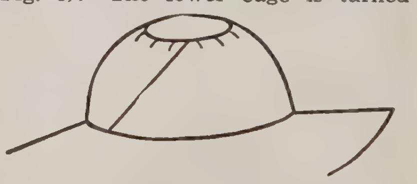


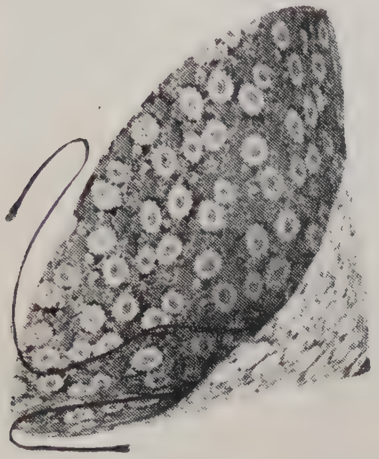
Fig. 8.

**Finishing**

Trim with a stitched band of material cut on the bias, either of the covering or underbrim. Ribbon can be used, of course, but it has two disadvantages—it has to be removed if the hat is washed, and it fades readily in the hot sun. Strings to tie under the chin will keep the hat firmly anchored, if necessary.

Children's hats can be made in the same way and are often of material like their frocks or made from leftover pieces. Four sections instead of six in the crown will usually be found sufficient for a child. For ease in laundering the crown and brim can be finished separately and buttoned together or attached with press fasteners. Set a crossway strip (about ½in. wide when finished) over the clipped upstanding edge of the brim. Sew the buttons or half the fasteners to this band. The crown should be made with a sectional lining and buttonholes made through one thickness only so that the buttons are concealed.

### The Coolie Hat



This "sun-shade" is quickly and easily made. If difficulty is experienced in obtaining any stiffening medium, this hat can be made in sections and pieces of thin cardboard inserted to give the shape. Cut a circle of paper with a radius of about 11in. To do this tie a pin on the end of a length of cotton and stick the pin upright on the centre of the sheet of paper. Attach a pencil to the cotton and roll around until the pencil is held about 11in. from the centre. Using the pin as a pivot and taking care not to let the cotton unroll, describe a circle with the pencil. Cut in a straight line from the edge of the circle to the pin. Now overlap the cut edges for about a quarter of the area and try on the paper pattern to determine the correct size and shape you want your hat to be. Pin the edges over firmly and then cut from edge to exact centre in the same way as the flat brim pattern was made. Cut two pieces of material by the pattern, leaving turnings, and join the seams separately. Tack together with the right sides out, fold in half, and lay flat on the table. Press folds, then lift the material and put the two creases together, press again on the folds. Lift again and, placing two adjacent creases together, press the new folds. Repeat once more and there will be eight creases. Stitch once down each crease, starting about ½in. from edge, continuing straight through and stopping short about the same distance from the opposite edge. There should be four lines of stitching crossing neatly in the centre. Cut eight sections of light card to fit each "pocket" of the hat and slip them into place. Turn in the raw edges and stitch round the rim of the hat. Now all that is needed is a chin strap of two lengths of material or cord attached where most suitable.

If you have suitable stiffening, cut by the pattern without leaving a turning on the lower edge. Join the seam, press flat, and tack between the two covering pieces, taking care to make all three thicknesses lie flat without creases. Turn in the lower edges and stitch round once or twice. Now make the sectional stitching. Possibly you will have a little difficulty in getting the machine into the point of the hat. Start from the lower edge and take the stitching up as far as you can. The point can be covered with the cord from which the strings are to be made in this way; make a hole about ¾in. down and push an end of the cord through from inside. Leave enough for a string and secure with a few firm stitches, thus closing the hole; coil the cord round the peak, stitching it down carefully; push the other end through the point and stitch down opposite the other string (Fig. 9). Probably both strings will need attaching further down at the side, so try on to find the right place. Instead of cord, bias material cut ¾in. wide and joined into a tube and turned inside out with a bodkin will make the strings and peak trimming. No head lining is necessary for this shape.

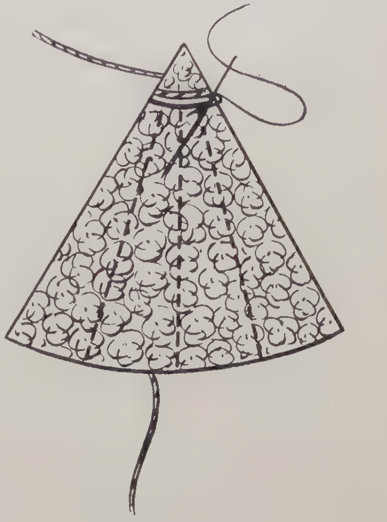


Fig. 9.

### My Love

*Just twelve brief, golden months*
*That sped like shining beads along*
*The thread of Time,*
*Since first he looked at me and stole*
*my heart.*
*That heart has still to leap*
*To his first word of love, and yet*
*I hold him close.*
*He took his first unsteady step today.*

—Nancy Bruce.

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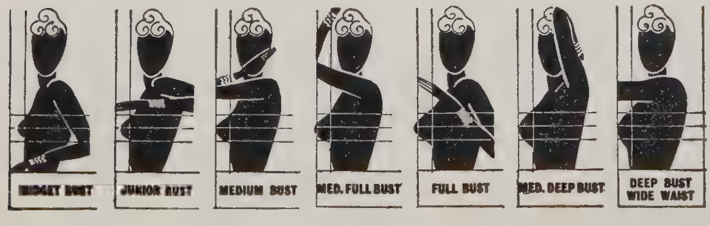

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DEEP BUST WIDE WAIST

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# VACATION—RELAXATION

*Contributed by the Department of Health.*

FOR those fortunate people who have yet to have their summer holidays, here are a few tips that will enable you to enjoy them. Some people get the idea that holiday time at the seaside or in the country or on the high hills is the time for cramming as much exercise as possible into a week or so. That sort of thing is all right for those super-energetic folk who have to be galloping around strenuously all the time, and who are trained for it, but for the average person the vacation should be just what its name implies — a rest and relaxation from toil.

Suitable exercise is good; unsuitable exercise is harmful. Climbing mountains all day, walks, playing games strenuously—these are all right if you're trained up for them. Your body will warn you if you're going at it too enthusiastically. It's natural to feel tired after exercise. It's rather a pleasant feeling—a comfortable kind of tired feeling—you don't want to do anything more, you're hungry, drowsy—pleasantly contented. After a rest, or a sleep, you feel good, and fit for lots more.

## *Stiff and Sore*

But if you've overdone things it's a different story. There's no comfort in the tired feeling—you can't sit easily or lie down in enjoyment of relaxation. You are stiff in places and sore. You're too tired to eat, and if you try to go to sleep, sleep just won't come. Your body is telling you that you've been foolish.

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Over-fatigue has its origins in our muscles. When in action they use up energy and produce waste products—particularly carbon dioxide and lactic acid. If the supply of energy material goes short and carbon dioxide and lactic acid accumulate, fatigue occurs. While resting, the accumulated wastes are removed from the muscles. A warm bath or shower followed by a cold shower stimulates the blood circulation which brings fresh oxygen and food to the muscle cells, and takes away waste products of fatigue. Thus the warm bath helps to prevent soreness next day, after excessive exercise.

In these holidays of yours aim at taking just the amount of exercise that gives you the pleasantly tired feeling, makes you ready for food, and fit for more exercise after a rest. If you go on to soreness and stiffness and overtiredness, you've got to recover; you're really losing time in your vacation. Take daily exercise, but nothing to excess.

**Children are liable to overdo it too, little children particularly. They may not complain of fatigue but they very readily get overtired. Then mother knows all about it—in irritability, fractiousness, and broken sleep. And that spoils mother's holiday, so it's best to put some thought and firmness into the routine of the vacation.**

## *Bedtime Hours*

Up to the age of 5 years, at any rate, the daytime rest should not be dispensed with because of the attractions of the beach, or the bush, or the farm, or whatever it may be. Nor should the hour for going to bed be lengthened out, because of the delights of twilight on the seashore. Keep regular bedtime hours for all the children—whether toddlers or school children. Twelve hours' sleep for toddlers and pre-school children, eleven hours' for primary school boys and girls, and ten hours' for secondary school giants of either sex—these should be holiday bedtime hours, if you want your children to get full benefit from their vacation. They'll beg to stay up longer at nights, and the little ones will want to dodge the daytime rest, but for their own sakes be firm and don't give in.

## *Lullaby*

*Moonbeams are tucking the baby clouds under,*
*Moonlight is smiling on you.*
*Stardust is lighting your eyes up with wonder,*
*Starlight is shining anew.*
*Far off in dreamland the fairies are waiting,*
*Parcelling dreams bright and new—*
*Hushabye, lullaby, baby, my baby,*
*Sleepytime's coming for you.*
—Mary Waters.

◆

## Wanderlust

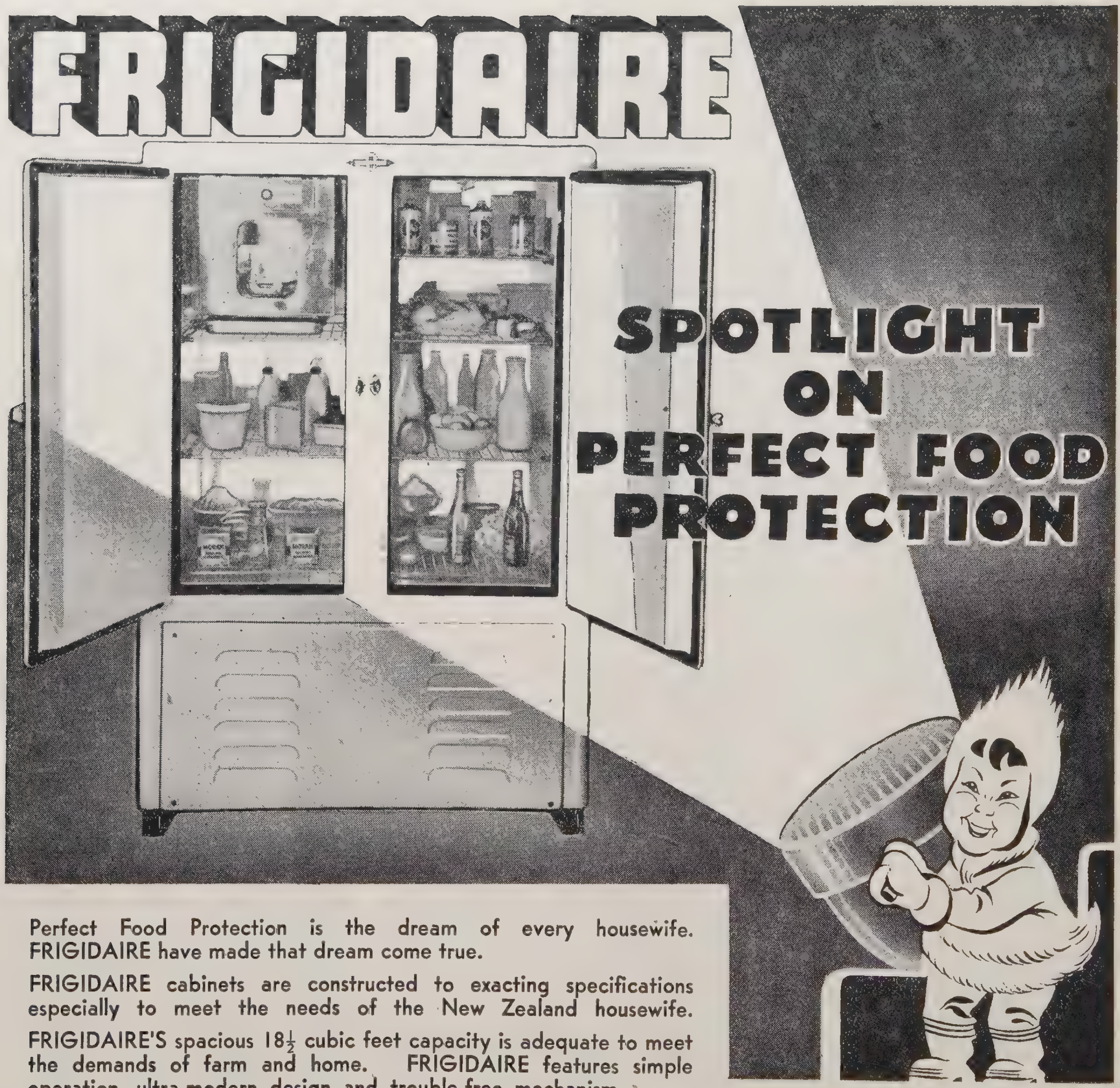
I HAVE been fascinated with the holiday memories and travel articles in the August "Journal." What a rich and varied treasure trove was unearthed! "Homespun's" contribution interested me particularly, as she had followed almost the same route across Belgium and down the Rhine as I did a few years before the war. I, too, visited St. Goar and climbed the Lorelei Rock, where we enjoyed a fruit flan made with luscious wild strawberries and topped with whipped cream.

In Cologne we had as a guide a man whose command of the English language was acquired while a prisoner in England during the Great War. Weren't we lucky to have seen Europe, and particularly London, before war devastated its historic beauties!—**"Sara E.," Central Otago.**

◆

## *TIME*

*Time is*
*Too slow for those who wait;*
*Too swift for those who fear;*
*Too long for those who grieve;*
*Too short for those who rejoice;*
*But for those who love*
*Time is*
*Eternity.*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# Strange Coincidences

*THE topic "Strange Coincidences" certainly proved a popular one with "Good Neighbours"—even some of the menfolk joined in! The variety of contributions and the unusual nature of many of the experiences recorded undoubtedly justify the maxim, "Truth is stranger than fiction."*

*The first prize was awarded to "Bebe M.", Napier; "Native Flower", Waipukurau, and "Pea", Hawke's Bay, shared the second prize. "Clara Jane," Rakaia, and "Twilight," Wanganui, were commended.*

## *First Prize*

THE lunch-time whistle had blown at the workshops. There was a slow, waning noise of machinery and the clatter of hurrying footsteps. James Smith made for his own special possie, the one he had claimed for the last 10 years, and Harry, his old pal, sat down nearby. James opened his morning paper with the automatic deliberation of years and folded it into a neat square; then, to the accompaniment of cheese sandwiches, he read the world news and then the local news. The talk around him held no distraction.

"Say, Harry," he said, "thought you were the only M—'s in New Zealand."

"That's right." Harry spoke with a slight Yorkshire accent. "All the M—'s in this country are related."

"Then you know this Charles M— who's just got engaged. The notice is in the paper here. See."

Harry took the paper and read the short engagement notice. Charles M—, 2nd N.Z.E.F., engaged to Mary Jones, of Dashwood. He flicked the paper with his hand and his voice trembled with excitement.

"If that is not my long-lost brother, I'm a Dutchman," he said. "My mother died when Charlie was six weeks old and we were all put into orphanages. Nobody knew what became of the baby. I've searched for years for this brother. I must find out if it is."

"Try and get in touch with the girl," someone suggested.

"There are about 10 Joneses in Dashwood that I know of," said another. "I come from there."

"Go to the paper office and find out."

"The paper won't give out information like that."

Everyone was interested and full of ideas.

"I'll contact all the Joneses I know in our suburb," offered the man from Dashwood.

But some weeks went by and nothing came of the incident; then one morning the man from Dashwood had some news.

"Harry, that M— you thought was your brother was married yesterday. I'll give you the address of the girl's people."

"Splendid. I'll go out on Saturday and make inquiries."

Mrs. Jones was only too willing to supply Harry with a few details. Yes, Charles was a Yorkshire man and about 35 years old. He was short, dark, very much Harry's build, in fact very like him in features. Charles was an orphan and had no relatives that she knew of. Mrs. Jones was as excited as Harry and strongly advised him to write to Charlie, whose address she supplied.

The investigations finally led Harry to Hawke's Bay in order to establish relationship. Papers, birth certificates, and dates all coincided. Harry beyond doubt had found the brother from whom he was parted 35 years before. Charles was amazed to find he was one of six children when he had assumed he was without kith or kin. He had been parted from his family as a tiny baby. Both brothers had left England in the same year.

An engagement notice in a morning newspaper and an unusual surname were primarily responsible for the reunion of two long-lost brothers.

**"Bebe M.", Napier.**

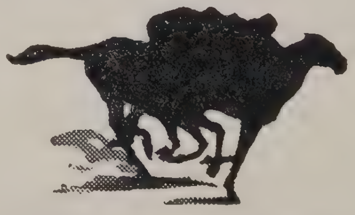
## Mary's Song

*O, Mary the maiden walked in the meadows,*
*And Mary the maid was alone;*
*O, she sang a small song as she tripped through the grasses,*
*And the song was of joys of her own.*
*O, Mary the maiden walked in her garden,*
*And tall was the lad by her side;*
*O, Mary's heart sang, for her joy and her gladness*
*All sadness and sorrow defied.*
*O, Mary the mother walked with her treasure,*
*The tall trees green banners unfurled,*
*O, Mary's heart sang, and this song the sweetest,*
*The mother-song of the whole world.*
*—Mary Kitching.*

## *Second Prize (equal)*

IN England 50 years ago the village folk would look alarmed and whisper "Bad news coming" if a bird flew against their window. This superstition probably resulted from the practice of sending messages by carrier pigeon before telegraphy was known. Be that as it may, nursemaid tales did their work upon me, and even to-day, at middle-age, if a bird hits my window something goes "ping" deep down in my subconscious self. Imagine, then, my consternation during the last war, when two little sparrows continued to hurl themselves at the kitchen window.

It was towards the end of 1943, on the day that an official announcement was made that the New Zealanders had been in action in Italy for the first time. I was in town when I heard the news and as my son was with the Division I felt certain suspense, which changed to a cold, gripping terror when I reached home and found two sparrows hurtling at the window. I immediately opened wide the window so that they should have nothing to fly against. They flew into the kitchen and banged their way round and round. I chased them out and shut the window. They then took up their position on an overhanging porch and used that as their taking-off place while they flew again and again at the window, scrabbling at it with beak and claws. I stuffed up the ledge on the roof with paper and they moved on to the sitting-room window



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and kept up the attack at one place or the other until dark and resumed it the next day. When they ceased in the middle of the morning I felt like a piece of chewed string but did not share my fears with either my husband or younger members of the family.

A fortnight later news came that my son had been wounded. Friends commiserated with me but I felt an overwhelming relief that my worst fears had not been realised.

Was this just a coincidence or a touch of the supernatural? It beats me..—**"Pea," Hawke's Bay.**

## Competitions

### *FEBRUARY*

Don't forget to enclose a stamped, addressed envelope for the return of the photos and negatives which you are entering for our "Photographic Contest"—closing date February 15. The descriptive paragraph pertaining to each snapshot must not exceed 100 words.

### *MARCH*

Every member of our ever-growing circle of "Good Neighbours" uses a pen-name. Perhaps it is your own Christian name, or the title of a song, or the name of a favourite character in fiction; maybe it commemorates some scenic feature of your immediate surroundings (such as "Green Acres," for instance), or it may indicate your favourite hobby. Whatever the story underlying your choice of pen-name, do share it with your fellow-readers. A prize of 10/- will be awarded for the best effort and there is a second prize of 5/-.

"MY PEN-NAME."

The last day for receiving entries is March 15.

MARY,
"Journal of Agriculture,"
Box 3004, Wellington.

## *Second Prize (eqaul)*

AN R.A.A.F. airman in Canada who was attached to the Empire Training Scheme was spending leave in America and stayed with a very hospitable American family for a weekend. When he left his hostess wrote to his mother telling her that she had entertained her son and that he was well and happy. She also mentioned that she had a son of her own overseas somewhere and hoped that someone was making things easier for him as she had done for this boy.

At the time the letter was received in Australia a young American was being made "at home" for the week-end and the letter was read aloud to everyone in general. As the name and address at the conclusion of the letter were made known the American jumped up from his chair with the cry, "That's my mother!"

I think that was a really happy coincidence.—**" Native Flower," Waipukurau.**

## *Commended*

THIS might be called a recurring coincidence: whenever I make jelly it rains. I've tried placing the bowl of jelly in cold water to make it set quickly, and so avoid wet weather, but to no avail. If it doesn't pour, it drizzles, and always within 24 hours. Such an occurrence is particularly annoying during harvest-time, for jelly makes a refreshing dessert, yet we want every bit of sunshine to get the crops harvested in time.

Sometimes when I want to try something different in the way of a pudding I suddenly think of a jelly. I debate the issue—surely it could not rain on such a perfect morning—or evening. Once after I had made jelly, however, a severe hailstorm came up within an hour and put out the electricity. It created such an uncanny atmosphere as we huddled together in the dark watching the windows and thinking of my deed. In the end I was forbidden to make jelly except when the weather was of no importance.

Again my belief is proving itself for as I write this I can see flashes of lightning cutting the sky and the radio programme is being interrupted by static. Is it a coincidence that I made a gelatine froth for a sponge today?

**—"Clara Jane," Rakaia.**

IN the days when wireless sets were not so common an old couple were sitting outside their cottage in the country when suddenly the air was filled with music—a tune they both knew well, as it was their son's favourite and he had often played it for them on the tiny piano in the parlour. The son had died in tragic circumstances, so that the tune coming out of the blue was a shock to them, especially as the player had the same touch as their son's. They listened with tears in their eyes and silently turned indoors at the last note. If they had only waited the strange occurrence would have been explained. Unknown to the old folk a wireless in the big house up on the hill was broadcasting a competitions programme, the competitors being children. One of them was their grandson who, many miles away in the city, played the favourite old tune his father had taught him to love. What stranger coincidence could have occurred than that the wireless should have been installed only that afternoon and the old couple heard that particular broadcast?—**"M", Feilding.**

MAY a mere male intrude (and one who, alas, is no longer a rural dweller?)

It happened many years ago when gold coins were something more than museum pieces. My duties required me to proceed along a certain street at a certain fixed time every afternoon and for no reason at all I had developed the practice of crossing the street at a particular place. One afternoon, as I stepped from the kerb, I saw a half-sovereign lying in the watertable and was not too proud to pick it up and put it in my pocket.

On the following afternoon, as I neared my accustomed crossing-place, I recalled the event of the previous day and the thought passed through my mind. "Well, if there is another half-sovereign lying around waiting to be picked up it won't be just here, so I had better cross the street somewhere else." I went on another 20 yards or so, crossed the street (I could find the exact spot even now) and, as I was about to step up on to the kerb on the opposite side, there it was—another half-sovereign in the watertable!

Some day I shall go back to the town where this happened and at a certain precise hour I shall cross that street at a certain spot. Though I cannot hope to pick up a half-sovereign, who knows but there may be a poor substitute in the shape of a Reserve Bank note!

*—"Hemi Pango", Wellington.*

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# SPREADING THE FOOD RATION

## WORLD FACES ACUTE SHORTAGE

By NORMA METSON, *Rural Sociologist, Wellington.*

***THE world shortage of food which is likely to continue for several years will be acute during 1946. Meats, fats, and sugar, which have been in shortest supply during the whole war period, are the foods still most urgently needed. Too little total food means that the body's reserves are gradually used up, with consequent loss of weight, lack of energy, and lowered resistance to disease, leading eventually to starvation and death.***

UP to a point, different food groups can be substituted for each other in order to keep the food intake at a satisfactory level. For example, in their wartime diet the British people have more bread and potatoes and less meat and fats than they had before; but this cannot be carried too far without the risk of nutritional deficiencies. If there are extensive shortages, malnutrition is inevitable.

If there are not enough fats, which are a concentrated source of calories, it is very difficult for heavy workers to take sufficient food for their energy requirements and for ordinary people to keep warm in winter. Meat is a principal source of first class (animal) protein. Cheese, eggs, milk, and fish which provide similar food values are just as likely to be scarce. Vegetable proteins cannot replace them completely. In adults, lack of protein causes the breakdown of body tissues; in children it means stunted growth. Sugar provides calories in the most readily available form, as well as a pleasing flavour.

In New Zealand, butter, meat, and sugar are rationed, and our original rations have been reduced.

**Figures supplied by the Economic Information Service, Wellington, show these cuts have meant that from New Zealand sources 1,700,000 more people in Britain can be provided with their weekly butter ration and 650,000 more with their meat ration.**

Before, we were supplying butter rations for 39 million British people, and meat rations for 9½ millions.

In response to appeals from people who wish to make an additional personal contribution, the Minister of Supply has recently announced a scheme for the voluntary saving of food coupons. Every coupon handed in under this scheme, or destroyed by the holder without being used, means more food for Britain, where the need has never been more urgent than now.

For housewives who have difficulty in spreading their rations to meet household needs, and for those who would like to support the "More for Britain" campaign by economising in their consumption of rationed foods, the following suggestions for making rations go further should be useful.

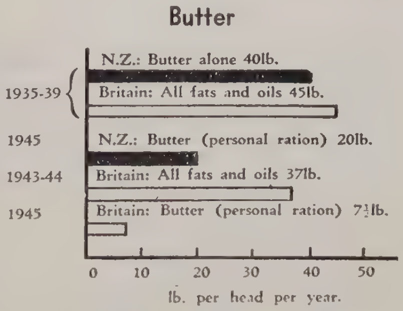

*Fig. 1*—**Butter and fat consumption.**

**1. For Spreading:** Soft butter spreads more easily, and goes further than hard. If you keep the butter in a refrigerator or cooler during the warm weather, be sure to bring out sufficient for the meal a short time before it is needed, and leave it in a warm place to soften. On a larger scale, butter for table use or sandwich spreading may be "stretched" as follows:—

Make a milk jelly mixture by dissolving one heaped teaspoon of gelatine in hot water and adding to ½-cup of warmed top milk. Beat this gradually into ¼lb. creamed butter, add a pinch of salt and leave to set. Custard made with ½-cup top milk and one heaped teaspoon of unsweetened custard powder may be used instead of the gelatine mixture.

For sandwiches, especially those with creamy fillings, butter only one slice of bread and spread the filling on the other. Suitable bases for such fillings are cottage cheese; grated cheese beaten to a paste with top milk, salad dressing, tomato sauce or tomato juice; fresh dripping seasoned with salt and pepper and vegetable or meat extract; liver, meat or fish paste; and, of course, if you can get it, peanut butter. A creamed mixture of butter and honey or golden syrup is good for spreading on scones, pikelets, plain biscuits or bread, and goes much further than if the ingredients are spread separately. Putting butter straight on to the bread (instead of first on to the side of the plate) and spreading a whole slice at a time are economical habits though they are contrary to the accepted code of table manners.

**2. Butter Economy in Cooking:** Most people by now have become accustomed to using for cakes, biscuits, and puddings recipes which contain little butter. Housewives should not have much difficulty in finding such recipes. Home-made shortbread and other butter-consuming delicacies are just memories or things to be put only in a very special parcel for overseas. Small economies which help are:

(a) Never use butter for greasing dishes, or for frying.

(b) Sprinkle grated cheese on the top of baked dishes, instead of dotting with butter.

(c) Brush the tops of scones, etc., with milk instead of melted butter.

(d) Use less butter when making sauces, and if the sauce is for a savoury dish, or to serve with vegetables, use fat instead of butter.

(e) Sometimes make your hot "buttered" toast with dripping, and sprinkle with salt and pepper.

**3. Fat for Cooking:** Stores in the larger towns occasionally have stocks of a blended vegetable fat which is very suitable for cooking. Ordinary clarified dripping from roasts and so on is quite good for making mixtures such as spice biscuits and gingerbread in which plenty of flavouring is used, or for pastry for savoury pies. To clarify dripping of this kind, put it in a heavy saucepan with one small cup of cold water to each pound of fat. Heat carefully and allow to simmer for a few minutes, then strain through muslin and leave in a bowl to set. When the fat has set, lift it off the water and scrape the bottom of the lump. If a whole lemon is cut up and heated with the fat and water the fatty flavour will be less pronounced.

For use in cakes and puddings with a more delicate flavour, satisfactory substitutes can be made by rendering down fresh fats of the suet type. The fat should be cut in small pieces, put in a heavy pan with a little water and simmered gently for an hour or two until all the fat is extracted. Care should be taken to see that the fat does not reach smoking temperature, or burn at the bottom of the pan. Strain, and then if you wish to use the fat fairly soon, pour it into a bowl and when it begins to set beat in ½-teaspoon of salt and ½-cup of warm milk for each pint of fat. If you want to keep the fat for some time, allow it to set in the usual way and when you want to use it, add the milk and salt and reheat the fat carefully until it has melted. Allow it to cool and beat it up when it is cool enough to cream.

This treatment makes the fat more like butter because it adds salt and moisture (ordinary butter has been salted, and is about 15 per cent. water; lard, dripping, and prepared vegetable fat have little or no moisture or salt). If plain clarified dripping, lard, or vegetable fat are being used to replace some or all of the butter in a recipe, better results will be obtained if:—

(a) A pinch of salt is added.

(b) Slightly less fat is used than the amount of butter it is replacing. (⅞ cup or 7oz. of pure fat is equal to 1 cup or 8oz. of butter).

(c) A little more liquid is added.

When we eat less butter we cut down on one of our best sources of vitamin A, so we must be sure we get it in other foods. The fish liver oils we take for vitamin D contain liberal amounts of vitamin A also. Liver, eggs, cheese, green vegetables (the greener the better) carrots, and other yellow vegetables, fruits, and milk are all good. From this list the foods which are most easily obtainable at different times can be selected.

## Fat for CORSO

On behalf of UNRRA the New Zealand Council of Organisation for Relief Service Overseas (CORSO) is appealing for fat to send to Europe for soap-making.

**Endeavours are being made to organise a national drive, and in the meantime individuals and local organisations (many of whom already have the matter in hand) are urged to save fat, and plan ways in which it can be collected, rendered down and packed into containers such as oil drums suitable for export.**

Fat in such containers should be marked "FAT FOR UNRRA" consigned to the nearest Ministry of Supply store at Auckland, Wellington, Lyttelton, or Dunedin, and notification should be sent at the same time to Box 11, Government Buildings P.O., Wellington.

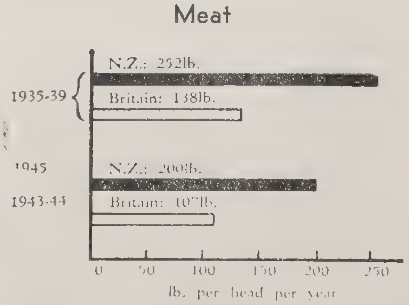

*Fig. 2*—**Meat consumption.**

New Zealanders before the war were noted for the amount of meat they ate, and even with rationing consumption remains relatively high. Nevertheless, some people find it difficult to use less than they have been accustomed to and to keep within the ration scale.

**Meat Substitutes:** Here are the best meat substitutes. Often they have extra nutritional value not possessed by meat. The daily intake of milk—1 pint for adults, 1½-1¾ pints for children—supplies good protein. Fish, cheese, and eggs are excellent sources, while peas, beans, lentils, and peanuts all provide valuable protein supplements although they could not be relied on for the total requirement.

Cheese can be eaten uncooked as many people prefer it, or in cooked dishes (provided the cooking is for a short time, and at a low temperature, so that the cheese is not made hard and tough). Also try sprinkling grated cheese in white sauces for use in creamed dishes, or to serve with vegetables. Fresh peas and beans from the garden are delicious and are usually eaten with relish. The dried forms are a little more difficult to serve attractively, but are much higher in food value through loss of water.

Soya beans which contain very good vegetable protein can be grown in the home garden, and if the pods of white runner beans are allowed to ripen the beans are a good substitute for imported dried beans which are not obtainable.

If dried peas, beans, or lentils are cooked until tender, strained and rubbed through a sieve, the puree can form the basis of many interesting dishes such as mock cutlets or sausages, savoury loaves, croquettes, and cream soups. Cheese, onions, chopped bacon, and other well flavoured foods in small amounts are usually included in such recipes.

Dried skim and full cream milk have a good protein content and can be used frequently in cooking.

**Unrationed Meats:** Titbits such as liver, kidneys, and tripe are not rationed, and if these are fully utilised the demand for ordinary meat which can be exported is lessened to some extent. Many people who are prejudiced against the use of liver because of rejections through hydatid infection forget that liver, when not contaminated, is a very valuable food.

In country homes, rabbits, wild ducks, and venison may sometimes contribute to the larder while pot roasting and stewing can make the older and less tender fowls acceptable for eating. It may not be generally known that New Zealand has this year exported over two million rabbits to Britain but there should be sufficient rabbits for all.

**Meat Extenders:** Rationed meats can be made to go further by serving them in various ways. Grilled or fried steak and chops shrivel in cooking; a fair-sized piece when raw may look meagre when cooked. But steak and chops in casseroles and stews remain the same size, and give flavour and "body" to generous portions of vegetables and gravy. In addition, less expensive cuts of meat can be used. Steak and boned roasts can be stuffed with well seasoned breadcrumb mixtures, or served with dumplings

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Papatoetoe

or balls of stuffing. Steak and kidney puddings can have more kidney and vegetables, and less steak, and if this dish and other meat and vegetable combinations include peas and beans, as mentioned previously, their protein value is lowered very little. Oatmeal, wholemeal, and other cereal products can also be used to mix with meat and make it go further.

**On farms where there is home killing, waste should be avoided by proper butchering and facilities for keeping the meat, and by efficient meat-sharing arrangements.**

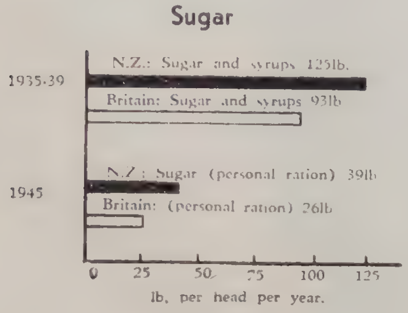

*Fig. 3*—**Sugar consumption**

Sugar is short because (1) European sugar beet crops have been drastically reduced; (2) it is needed in the manufacture of synthetic products, and (3) transport to non-producing countries is difficult. Sugar, while supplying no essential minerals or vitamins, provides calories which the body can use quickly and easily. In other words sugar does not belong to the "protective" foods which we need each day for good health, but it is useful in the "supplementary energy-yielding" group.

**One of the most noticeable changes in the eating habits of the Western peoples in the last 100 years has been the increase in the use of sugar and the corresponding decrease in the consumption of cereals and potatoes.**

A good way to conserve sugar is to like less. Many people put sugar on and in everything almost automatically. They rarely bother for instance to taste a pudding before smothering it with sugar, and frequently they lose appreciation of any flavour but sweetness. If foods have an interesting flavour—and spices and essences are not so difficult to get now—there is less need and desire for sugar. Tea and coffee should not be stewed or made too strong because that produces a bitter flavour and sugar in quantity is needed to counteract it. Sugar when it is put in a drink must be well stirred. One teaspoon of sugar properly dissolved has as much sweetening power as two or three left to lie at the bottom of the cup.

Sugar is a food we can profitably learn to like less. Nutrition experts assure us that our diet will improve rather than deteriorate as a result.

**Sugar Substitutes**: Golden syrup can be used for baking, and general sweetening. Separate recipes cannot be given but here are some general rules. They apply to treacle and molasses as well, but these are not really suitable for use in light cakes.

1. Golden syrup is not quite as sweet as sugar. When used the product has less sweetness, but a more distinctive flavour.
2. Syrup is less concentrated than sugar. In substituting, the same quantities should be used, that is one cup of syrup for one cup of sugar, but less liquid is needed—¼ cup less for every cup of syrup used. In most recipes, the use of syrup up to half the quantity of sugar is satisfactory.
3. Syrup contains a little acid which curdles milk when they are heated together. When using syrup to sweeten a sauce or boiled milk pudding, cook the mixture first and add the syrup afterwards. In a cake, for each cup of syrup used, ½ teaspoon of baking soda can be added to act with the acid as a rising agent, and 2 teaspoons of baking powder can be omitted from the recipe.

Honey is seldom plentiful enough to use for cooking but some families have their own supplies. Good clover honey with a mild flavour is best for baking. Vanilla flavouring should not be used in honey cakes, and the amount of liquid needs to be reduced slightly. **By volume measure** about ¾ cup honey is equivalent to one cup of sugar, but a **weight** of 1⅓lb. of honey is necessary to supply the sweetness of one pound of sugar. Strong flavoured honeys may not be so favoured for baking but they are very good for sweetening fruit drinks and sauces. Honey may be used instead of sugar in preparing syrup for bottling fruit. One to two tablespoons to one pint of water is enough.

### *A GLAD NEW YEAR*

*To leave the old with a burst of song,*
*To recall the right and forgive the wrong,*
*To dare to go forth with a purpose true*
*To the unknown task of the year that's new,*
*To help your brother along the road*
*To do his work and lift his load,*
*To add your gift to the world's good cheer*
*Is to have and to give a glad New Year!*

—**Robert Beatty.**

**Sugar beet is not grown in New Zealand on a commercial scale, but some people who have small amounts for stock feed have experimented with making their own syrup from it. Others have even grown a little as a sugar crop only.**

All ripe fruits contain sugar and most are sweet enough when raw. If the fruit must be cooked, put the sugar in at the last moment, as this prevents the fruit acid from lessening the sweetness during cooking. Dried fruits have a high percentage of sugar, and if they are used in puddings, scones, etc., the sugar in the recipe can be reduced.

A number of wartime recipes reduce the amount of sugar to a minimum. If these are used where possible and an effort is made to avoid the use of added sugar, considerable savings can be made.

## *The Homely Things*

*Christ talked of grass, and wind, and rain,*
*And fig-trees, and fair weather,*
*And made it his delight to bring*
*Heaven and the Earth together.*
*He spoke of lilies, vines, and corn,*
*The sparrow and the raven,*
*And words so natural, yet so wise,*
*Were on men's hearts engraven:*
*And yeast, and bread, and flax, and cloth,*
*And eggs, and fish, and candles;*
*See how the whole familiar world*
*He most divinely handles.*

### Conclusion

What we can save of foods already rationed may seem a very small drop in the ocean of world need. But remember that the 2oz. cut in butter meant full rations for 1,700,000 more people in Britain and that a further ounce saved by everyone here would mean another 550,000 rations. With other foods the position is similar.

Where much work and organisation were formerly devoted to sending food and other comforts to our forces and prisoners of war they are now in many instances devoted to civilian relief. Although people with relatives and friends in Britain are able to send parcels to them individually, wider help is obviously needed now. We can all contribute by economising in our use of rationed goods.

Data in the graphs reproduced in this article summarised from the New Zealand Official Year Book and "What Do They Eat in U.S.A., Canada, and Britain Today?" H.M. Stationery Office, 1944.

*Get thy spindle and thy distaff ready, and God will send the flax.*

*—Matthew Arnold.*

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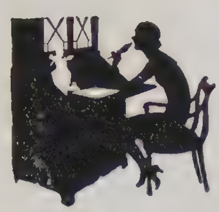
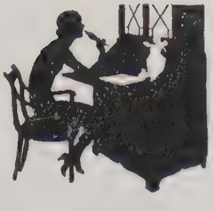


# Mary's at - Home -



I CAN appreciate "Homespun's" being unused to the personal touch which exists among New Zealanders, as I, too, lived in a big town before I came to New Zealand. Recently I read of a city bride who went to live in the backblocks in Australia. She was startled when a strange woman rode up and said, "You'll have to put up with me whether you like me or not —I'm your nearest neighbour for 25 miles." She proved to be a wonderful neighbour to the bride, ever ready to help in any way possible.

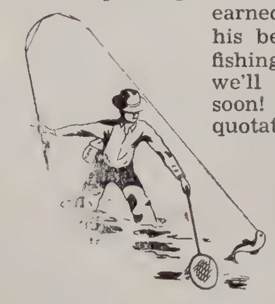
I like the way "Spring" says the chats by readers give us a human interest in our fellow-beings. In every one I find something of interest. The "Journal" is a great publication and always contains something constructive and uplifting. It cheers me greatly, especially when I am alone, which I am so often now.—**"Vee," Kati Kati.**

MAY I endeavour to be a "Good Neighbour"? I think your circle is such a happy one and prevents me from feeling lonely or out of things because we have no 'phone or radio. But a number of people seem to be more isolated even than we are and do not have the joy of a daily mail delivery.—**"Joan of all Trades," Putaruru.**

I NOTICED recently that one of your South Island readers said Spirits Bay was the place from which the souls of the Maoris departed for Hawaiki. That is not quite the case, although they pass along Spirits Bay on their way to the point of departure, Cape Reinga. A gnarled old pohutukawa stands on the rocky side of the cape, and the spirits are said to leap from this tree down into the surging waters below when they start their last journey to their old homeland. The Maori name for Spirits Bay is Kapo Wairua, said to mean "Catch my spirit." The story is that at one time a Maori belonging to this district was dying far from home. He sent word to his people to catch his spirit as it passed by Spirits Bay: hence the name. There are no Maoris living at the bay now, though some of them still make their kumara gardens out there.—**"J.W.," Te Hapua.**

MAY I join your circle? I always look forward to reading the "At Home" pages. I have just come upon some proverbs in an old book. Here are several from the Chinese: "If you do not scale the mountain you cannot see the plain"; "Who sits in a well to observe the sky does not see very much"; "Bow low when the eaves are low." The eaves of a house of trouble are always low and the chances are that you will break your head on the lintel if you enter the house too proudly. The only way is to keep your heart humble when trouble comes upon you.—**"La-de-da," Taumarunui.**

SON and I are general rouseabouts at the moment, as the head of the house is spending a few days' well-earned leisure at his beloved trout fishing. What tales we'll listen to soon! Here is a quotation on that all - important topic, sleep, from a health book I enjoyed reading recently. This is Shakespeare's definition:



*Sleep that knits up the ravell'd sleave*
*of care:*
*The death of each day's life, sore*
*labour's bath,*
*Balm of hurt minds, great Nature's*
*second course,*
*Chief nourisher in life's feast.*

—**"Roundabout," K.C.**

BEING a mother of three and having no electricity or modern conveniences my days are very busy. I find that dish washing and other more or less humdrum jobs are far less tedious if one has pleasant things to think about. The competition subjects you set each month help my days to pass happily—once having thought the matter out it does not take long to transfer those ideas to paper.—**"Fruffy," Te Awamutu.**

FAR from minding "Sue" completing the "Song of Degrees" in the September issue, I was delighted to have the last lines and will always treasure them. It is good to read all the friendly paragraphs, also the competition essays. We send our "Journals" away to folk in different parts of the world so that others may share in their helpful contents. I have kept some to make "Mary's" pages into a book to send to a special friend.

I have come to realise that interest and sympathy are tangible things to give each other whenever we can. There are many writers I would like to reply to here, if space permitted, but especially to "Homespun"—I hope she gets on well with her spinning and weaving and that she will still find time to write to the "Journal."—**"Caradon," Waikato.**

RECENTLY I spent a weekend on a farm in the country. The farmhouse was built right under the hills and away from the road. There was no electric light and the cows were all milked by hand. The farm was very well kept and instead of fences the owner had adopted the English idea of having tall, thick hedges separating the paddocks. Seen from the top of the hill behind the house the farm had the appearance of a patchwork quilt. Willows, poplars, and macrocarpas have been planted over the years and they, too, help to beautify the countryside. I loved to watch the wind whipping through the long grass, flattening it against the ground so that the fields looked as though they were filled with silver-green water. I found many birds'

## *THE NEW YEAR*

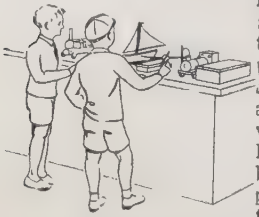
AT the incoming of a New Year I always think of Charles Lamb's wonderful essay in which he says he hates Time for hastening on. "I would fain lay my ineffectual finger upon the spokes of that great wheel. I am in love with this green earth; the face of town and country; the unspeakable rural solitudes; I am content to stand still at the age to which I am arrived; I and my friends; to be no younger, no richer, no handsomer."

How many of us are like that? I know I am. And one of my New Year resolutions always is to make the most of time, to stretch it out to the uttermost, to get all of beauty and love that is humanly possible, and to make life as happy as I can for those I love. Of course, like other resolutions, it wears thin as the year moves on. I become crabby with those of whom I am fond; I lose beauty, and I fall far short of my ideals. But to love the game beyond the prize—isn't that something? To love life is worthwhile, and it is also worthwhile to go on making the same resolution year in and year out for

"Ever at my back I hear
Time's winged chariot hasting near."

—**"Ellen Ephe," Clinton.**

nests also, and the garden was full of fragrant crimson roses. Altogether it was a very pleasant weekend.—**"I.J.S.," Otaki.**



YEARS ago when the children were small money wasn't very plentiful on our farm. One Christmas my two wee boys were having a day in town with me and I gave them each half-a-crown to spend. I had to make some purchases in a hardware store and while I was busy the lads each bought me a present before they spent a penny on themselves. I still treasure those gifts—two little green woodpeckers to hold pepper and salt, and a very pretty plate.—**"Curly," Southland.**

THE country is looking beautiful at present. Today I walked through the plantation and admired the fresh greens of larch and silver birch. The spruces and oregon pines have the quaintest tufts of tender new leaves at the tips of their branches, just like soft little tassels. I pulled some sprays of the different trees and as I write I can look at them in a bowl and seek inspiration from their beauty.—**"Cloudy," Ashburton.**

### PLEA

*Where all the beauty of this world must*
*pass . . . .*
*Music, and scented flowers, and sheathing grass;*
*Laughter of children; little furry things*
*That twist and hide; sunlight on soaring*
*wings . . . .*
*When all these go, then one thing I*
*would keep:*
*The memory of you in quiet sleep.*
—**Betty Maitland.**

I OFTEN wonder if we praise other people as much as we should do. We often admire a neighbour's capabilities, but we don't think to tell her so. Yet how much we all appreciate a word of praise. Many a time I have been feeling a bit "down," worrying over being a bad manager, or wondering whether I have dealt rightly with the children, and someone has popped in and praised something I have done, and straight away my inferiority complex has vanished.—**"Martha," North Canterbury.**

WE have purchased a dozen perching pullets this year. If they lay as well as they eat, we will never be short of eggs!—**"M.," Feilding.**

MY son, a bomber pilot who recently returned from overseas, is a subscriber to your "Journal," and we have copies dating back the last three years. I have found the "Good Neighbour" pages most interesting, and I feel that we farm women have a tremendous lot in common.—**"Cheerio," Te Rore Bridge.**

HOW I enjoyed the kind and loving thoughts expressed in the competition, "The Art of Being a Good Neighbour," and also your own article on friendship. What would this world be like without our friends—how warm and cheering is the comfort of feeling sure with a person! It was good to see "Khorasbad" back among the contributors. In January, 1942, she won a prize for her essay, "The Most Inspiring Word Today," and she chose "England." I'm sure all who read it were inspired by her vivid word picture. This winter and spring have been exceptionally cold and dreary almost everywhere, I think, and "Good Neighbours'" letters reveal how many have had to deal with mud and snow. Anybody who knows what this means will sympathise deeply.—**"Tiggetty Boo," Kati Kati.**

### FRIENDSHIP

*O friend, my bosom said,*
*Through thee alone the sky is arched,*
*Through thee the rose is red;*
*All things through thee take nobler form*
*And look beyond the earth,*
*The mill-round of our fate appears*
*A sun-path in thy worth.*
*Me too thy nobleness has taught*
*To master my despair;*
*The fountains of my hidden life*
*Are through thy friendship fair.*
*—Emerson.*

THE article on the East was very interesting and I loved the Maori legend. "Isabel Emm" well deserved the prize for the essay "Kumara Moon." Unless we plant more trees and take care of those we have this country will become a barren waste. I know of land that has been left untouched for the last 10 years and now small native trees are growing there. I do hope they will not be destroyed by fire. Three times last summer my husband had to fight fires started by careless people.—**"Scotty," Bay of Islands.**

TREES, like music, bring back memories to us. From my kitchen window I can see two silver birches, so beautiful just now in their summer attire. They always remind me of a lovely old tree growing by the gate of a town garden, for these are seedlings from that tree. It seems only a short time since they were planted and now the birds are singing in their leafy branches.—**"Tiare," North Otago.**

*Hence it is that old men do plant young trees, the fruit whereof another age shall take.—Sir J. Davies.*

BEING a new reader of the "Good Neighbour" section of the "Journal of Agriculture," I should like you to know how much I enjoy it. I was especially interested in your competition on "The Art of Being a Good Neighbour" and congratulate all the writers who contributed. I wonder if they have ever thought how much a good book is like a good neighbour. A book can be so friendly and companionable, so entertaining and helpful in many ways, assisting you to rest awhile and forget your worries. At present I am reading Rita F. Snow-

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## Beauty

HAS it ever struck you how many people pass beauty by unseeingly? Once I went to call on a friend, a busy woman with a large family. As I turned the corner of the house I saw a cluster of waxy-pink climbing roses against the drab grey wall. There were five roses in the bunch, each perfect in form and texture. When I pointed them out to my friend she said, "Do you know I've been in and out all day and haven't even noticed them."

I see beauty all round me: That clump of pines clear-cut against the skyline; arum lilies ghostly in the moonlight; small, green growing things pushing up through the bare earth; the scarlet and gold of nasturtiums tumbling down a railway cutting.

I am teaching my children to be seekers of beauty, too. As we walk along the country roads we note the glint of autumn leaves in the hedges; we study the wild flowers and grasses, and sometimes peep at a bird's nest. One never-to-be-forgotten day we found a hedgehog fast asleep in a nest of dried grass. Let us all spare a few minutes each day to admire the beautiful things around us.

—**"Honeysuckle Rose," Ohaupo.**

den's delightful book, "A Thousand Sunrises," and I'm finding in it such quantities of food for thought. I feel as if I am travelling with the writer through our beautiful country and am thoroughly enjoying every mile of the road.—**"Tui," Hawke's Bay.**

I HAVE been the recipient of many lovely calendars. One of them was a tiny print of a landscape in Kent—a field of ripe corn studded with scarlet poppies, and a glimpse of blue sea and white cliffs through the coppery trunks of pine trees beyond, all just as I remembered it while walking in the Pilgrim's Way to Canterbury one autumn before the war.—**"Sara E.," Otago Central.**

THE gorges are lovely here, but the very hard winters have hurt us rather badly lately and one grows to fear the months of snow. Just now it is unbelievably beautiful. The growth is so fast that folk don't believe us when we talk "our garden."—**"B.D.," Tekapo.**

HOW true about the quieter sisters and friendship; courage is sometimes needed even to say, "Hullo." When you are sensitive and a victim of shyness you are often inclined to become aloof and abrupt. Your advice is very encouraging. I find that instead of worrying whether you did the right thing or not, if you develop a sense of humour it helps you to do better next time and you become much happier in consequence.—**"Clara Jane," Rakaia.**

SUSIE has begun to think things out. She said to me today, "Why does Mr. C's horse wear heel-plates, Mummie?" I love to hear children's sayings, don't you?—**"Bee," Timaru.**

I HAVE read your pages for some time now, but in my busy life I have not found time to write to you before. The competition subject "In What Way Would You Improve Rural Living?" was irresistible, and I would have liked to spread my ideas over a few more pages.—**"Ednamay," South Otago.**

I THOUGHT the "Art of Being a Good Neighbour" splendid. I have had many good neighbours and trust that I have been one, too. I used to live 11 miles from the nearest township, and 2 to 3 miles from a telephone, mail delivery, and neighbours, so you can realise what good neighbours meant to me. At present we are within a mile of neighbours and 3 miles across country from the same township, but I will never forget that splendid friendship formed 20 years ago in the tussock country.—**"Pussy," Fairlie.**

*Thanks to the human heart by which*
*we live,*
*Thanks to its tenderness, its joys, and*
*fears,*
*To me the meanest flower that blows*
*can give*
*Thoughts that do often lie too deep*
*for tears.*

—*Wordsworth.*

I THINK rural women should have a chance to learn the art of using a few carpentry tools. There are heaps of handy things a country woman could make for the house if she only knew how to handle tools the proper way. Lots of times I've wished I had learnt to use a saw and hammer.—**"New Chum," Otautau.**

YEARS ago I heard one of Handel's oratorios in the Sydney Town Hall. The soloists were all celebrated singers and the choir comprised 200 voices. It was a first night and the Governor-General and his lady were present and the hall was crowded. The beautiful costumes of the great artists, the lovely voices, the whole brilliant scene—these were something to remember all my life.

Your letter, "Trees," delighted me and brought back many childhood memories. While staying in Victoria some friends and I went to see a football match and we all sat on the bough of a fallen gum tree. One of the girls started to bounce up and down, and to save myself from falling I held on with both hands, but lost my balance, turned a somersault, and landed on a jumper ant bed. These

## JANUARY

WHEN I was a child at school I used a slate to which a damp sponge was attached by a piece of string. I can still remember the feeling of intense satisfaction I enjoyed when, covered in errors and corrections, that slate was wiped clean of all its mistakes, and its dark surface was ready for a fresh beginning.

To me the month of January is a miracle, and the one I love the best. The past year, with all its errors and corrections, has been wiped out, and, like the lessons on my childhood's slate, all that is left is the promise of a fresh start, and the memory of mistakes to be avoided.

My heart is full of the joy of Christmas, and the message of "Peace on earth, goodwill toward men." My soul is refreshed, and strengthened, and, with the approach of the new year, I have re-created a stronger desire to make it a happy one.

And January is the beginning of the year. January, and summer weather; golden days, full of sunshine, and children's happy laughter; gardens gay with flowers and perfume. There is time, now, to drink in all the beauty of the season; to lie under shady trees and watch the blue lace of the sky through the branches; to gather the ripe fruits and vegetables from the garden, and appreciate the freshness of their flavour; time too, to plan ahead, and profit by those past mistakes, knowing that the whole year lies ahead, unblemished and untouched... It is a time of maturity, when the summer sun ripens the seed and the harvest. O! golden month of dreams, if you could but linger. So swiftly the days pass, carrying you into the long year. There is autumn ahead, and winter. Spring, too, and summer, but January is the peak of fulfilment, and the high light of the year.

There are no marks on the slate. No errors committed. So much depends on **me** to keep that record clean. My heart is filled with peace and humility, beauty and resolution.—**"Faraway," Gisborne.**

ants literally bite and soon I was covered with them, and had to be rushed off home to change my clothes. So your exploits where trees are concerned were more fun than mine.

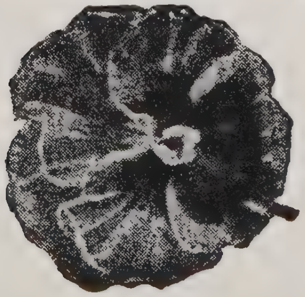
New Zealanders have been very short-sighted in allowing the beautiful bush to be cut down so ruthlessly. I have some lovely bush here which forms a sanctuary for pigeons, tuis, bellbirds, and other native birds.—**"Vee," Kati Kati.**

THIS is the day of the month I look forward to—the "Journal" has arrived and I turn eagerly to "Mary's" pages. I thoroughly enjoyed the article on trees, and the lines, "It gives me keenest pleasure

> To walk through the bush in the sunshine when winter's gloom has fled,"

found an echo in my heart. Ten thousand acres of our land are covered in birch trees—both the red and black varieties—and some of my most memorable rides on horseback have been through these forests.—**"Huntsman's Horn," Southland.**

CARLTON SPECIALS



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## *ONE GARDENER TO ANOTHER*

I READ with interest "Vista's" paragraph on Beverly Nicholls's books. His gardening books are what I term my bedtime reading and they live beside my bed. Has "Vista" read any of F. Fraser Darling's books? I am half way through one called "Island Farm," and will be extremely sorry when it is finished. The volume is illustrated with beautiful photographic plates and is the story of the author's struggles to wrest a livelihood from an island off the west coast of Scotland. My pioneering great-grandparents hailed from that part of Scotland, so the book has a particular appeal to me.

My own struggles in the garden come dangerously near to disaster at times—I find myself contending with a wicked cow, an over-affectionate magpie, and an erring husband who will drive the car over a specially-treasured flower bed!—**"Maghie," Marton.**

WE'VE had at least a month of gales so that my new garden, which was beginning to look bright, has almost been blown out over our heads. I did a silly thing, too. I bought a pretty pink lychnis to flower in the spring and then gave it an overdose of stimulant and it expired. My heart was sad for it was one of my "prize money" collection. But I'll know better next time! I am getting such a thrill out of making a garden where there's never been one before. I have a little niece and nephew not yet school age and they visit me quite often. They still pull up their flowers to see if the roots are growing. I have to answer their questions by the hour—their interest in my new home never wanes.—**"Tiggetty Boo," Kati Kati.**

MAY I join your circle? I feel I have much in common with all your pen-friends. How I look forward to the "Journal" each month. Eagerly I turn over the pages till I come to the "Good Neighbour" section. The competitions are so interesting, also the poems, extracts from letters, and the recipes. At present we are busy planning our vegetable and flower gardens. These beautiful warm days lure one into the garden, don't they? **—"Emmy Em," Otorohanga.**

MY dahlias are shooting again. I hope they prove as good as last year's. The apple trees promise a good crop should our frosts be scarce. The sun has been really beautiful today—indeed, I feel as though I may be a trifle sunburnt.—**"Roundabout," K.C.**

## Samples from my Scrap-book

JUDGING by some of the lovely thoughts of your Good Neighbours, Mary, I think they must enjoy beautiful things, and I wonder just how many of them keep a scrap-book for a hobby. I do, and in it I enter poems chosen from your pages in the "Journal of Agriculture" and any scraps and odds and ends that interest me, or that I think are beautiful and worth remembering.

Here are just a few samples:—

*"People often have to grow potatoes who would rather grow roses."* (How true! And yet, there is a certain satisfaction about growing potatoes, isn't there?)

*"Merely to be alive is adventure enough in a world like this, so erratic and disjointed; so lovely and so odd, and mysterious and profound. It is, at any rate, a pity to remain in it half dead."*—Walter de la Mare.

*"I am an old man, and have had many troubles, but most of them never happened."*—(Carved over an old mantelpiece).

*"God gives every bird its food, but does not throw it into the nest."*—An ancient proverb.

*"My walls outside must have some flowers: My walls within must have some books."*—W. H. Davies.

*"I am so glad of the colour of things!*
*Night, of course, is blue,*
*And morning, red and yellow, like a tulip.*
*Adventure is golden,*
*Because of the sun on brass helmets.*
*Love is white, glowing.*

*I know what I'll do!*
*I'll gather them all together and make a stained glass window of them*
*Inscribing it thus:*
*To the glory of God*
*In loving memory of*
*My days on earth."*

(This is from one of Rita Snowden's books which I always enjoy).

I do hope some of your readers will enjoy these scraps. I get endless pleasure from my scrap-book, and when I am reading I am always on the alert to find new pieces to add.—**"Snowy."**

# CHOCOLATE FOR CHOICE

CHOCOLATE cake is a favourite with most families and it is not only popular at afternoon tea time or supper, but it is delicious as a pudding served with hot chocolate sauce in the American way. Left over chocolate cake can be made into trifle by spreading it with jam and soaking it in fruit juice as you would a plain sponge, and adding a tablespoon of cocoa and ½ teaspoon vanilla essence to your custard mixture before pouring it over the cake.

If you have difficulty in getting your children to drink enough milk try giving them chocolate milk instead. Mix together a cup of sugar, 1½ cups of water and 4 tablespoons of cocoa, and boil for 5 minutes. Leave to cool, stir in ½ teaspoon of vanilla essence and pour into a screwtop jar or bottle. Use this chocolate syrup in the proportion of 3 teaspoons of syrup to 1 glass of milk. The milk may be served either hot or cold, according to individual preference. A party touch may be introduced by adding malted milk as well as chocolate syrup to the milk and beating till the drink is frothy. The syrup can also be used in junkets, custards, steamed puddings, and gelatine desserts.

Chocolate bran muffins and scones are welcome additions to school lunches, and chocolate bread is ideal for sweet sandwiches containing fillings such as raisins, dates, honey, nuts. Besides its considerable appeal as a flavouring, cocoa is an energiser and a valuable food in itself.

### CHOCOLATE SCONES.

2 tablespoons cocoa, 1½ cups flour, 3 tablespoons raw sugar, 1 teaspoon cinnamon, pinch salt, ¼ teaspoon spice, 1oz. butter, 2 teaspoons baking powder, milk to mix.

Sift the flour, and add the cinnamon, spice, cocoa, and baking powder, and lightly rub in the butter. Add the sugar and a pinch of salt and mix to a soft dough with milk. Roll out on a floured board and cut into rounds. Bake in a hot oven for 10-12 minutes.

### CHOCOLATE BREAD.

1¾ cups flour, 1½ dessertspoons cocoa, ¼ teaspoon salt, 2 teaspoons baking powder, ¼ cup sugar, 1 egg, ½ pint milk, 2 dessertspoons butter or dripping.

Melt the butter or dripping, blend the cocoa with it and beat in the sugar. Sift the flour and baking powder, add the salt, and then the cocoa mixture. Stir in the beaten egg and the milk. Mix well together and then place in a greased bread tin and bake in a moderate oven for 1 hour.

### CHOCOLATE JELLY.

1 tablespoon cocoa, ½ pint water, ¼ pint milk, ½ pint vanilla jelly.

Make a vanilla jelly in the usual way, but using only ½ pint water. Warm the milk and dissolve the cocoa in it. When the jelly is cold stir in the cocoa mixture. Pour into a mould to set. Serve with fruit or custard.

### CHOCOLATE FLUFF.

2 cups milk, 4 dessertspoons sugar, 1 tablespoon cocoa, essence of vanilla, 1 egg, 2 dessertspoons gelatine.

Mix the cocoa and sugar with a little of the cold milk, and beat the egg yolk. Heat the remainder of the milk, stir in the cocoa mixture, and vanilla essence, and then the egg. Leave to cool. Dissolve the gelatine in a little hot water and add. When the mixture is beginning to thicken, whip the egg white stiff and fold into the pudding. Pour into a mould to set.

### CHOCOLATE PIE.

Short pastry, 2 cups milk, 2 eggs, vinegar, 6 tablespoons sugar, 1 tablespoon cocoa, vanilla essence, 1 dessertspoon cornflour, pinch of salt.

Line a deep pie plate with short pastry and bake. Blend the cornflour, 2 tablespoons sugar, cocoa, and egg yolks together, and stir into the milk which has been brought to boiling point. Cook till it thickens, then flavour with vanilla essence, and pour into the pie shell. While this is set-

13.5

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ting beat the egg whites with a pinch of salt and 3 drops of vinegar and 4 tablespoons sugar till stiff. Pile on top of the custard filling and bake in a cool oven till the meringue is crisp.

### CHOCOLATE PANCAKES.

1½ cups milk, 2 eggs, 4 tablespoons flour, 3 tablespoons sugar, 2 tablespoons cocoa, fat for frying.

Blend the cocoa with a little cold milk and add it to the remainder of the milk which has been brought to boiling point. Stir in the sugar and leave to cool. Beat the eggs, mix in the sifted flour, and add the cocoa mixture. Drop tablespoonfuls of the batter into hot fat and fry. Sprinkle with icing sugar or jam, and serve hot.

### CHOCOLATE APPLE SHORTCAKE.

1½ cups flour, 1 egg, 2oz. butter, 2oz. lard (or 4oz. dripping), 1 tablespoon cocoa, 1 teaspoon baking powder, essence of vanilla, apples, lemon rind, dates or raisins.

Cream the fat and sugar, add the beaten egg and vanilla essence, and stir in the sifted flour, cocoa, and baking powder. Roll out on a floured board and line a deep pie plate with half the pastry. Slice the apples into this, and add a layer of dates or raisins, and sprinkle with finely grated lemon rind. Cover with the rest of the shortcake mixture. Bake in a moderate oven.

### CHOCOLATE DOUGHNUTS.

2 cups flour, ½ cup sugar, 2 tablespoons cocoa, 1 egg, 1 teaspoon butter, ¼ pint milk, ½ teaspoon baking powder, pinch of salt, fat for frying.

Beat the egg and sugar together, and add the cocoa. Melt the butter and add to the milk, and then stir this into the sifted flour, salt and baking powder, blending in the egg mixture also. Drop spoonfuls of the batter into boiling fat and fry till a golden brown. Drain well and dust with icing sugar before serving.

### CHOCOLATE DATE CAKE.

2oz. butter and 2oz. lard (or 4oz. beef dripping), 4oz. sugar, 1 egg, 7oz. flour, 1 teaspoon cocoa, ½ teaspoon cinnamon, ½ teaspoon spice, 1 teaspoon baking powder. **Filling:** ½ cup dates, ½ cup water, ½ cup icing sugar, vanilla, 1 tablespoon cocoa.

Cream the fat and sugar together, add the beaten egg, and then mix in the dry ingredients. Press half the mixture into a flat cake tin and spread with a filling made of ½ cup dates, ½ cup water, ½ cup icing sugar, 1 tablespoon cocoa, and vanilla essence to taste, cooked together till thick. The mixture should be allowed to cool before spreading on the cake. Cover with the other half of the cake mixture and bake in a moderate oven for 30 minutes. Cut into squares while warm and sprinkle with icing sugar.

### CHOCOLATE CAKE.

2oz. butter, 1 egg, 2 teaspoons cocoa, 1 teaspoon baking powder, 1 teaspoon baking soda, 1 cup flour, 1 dessertspoon golden syrup, ½ cup sugar, ½ pint milk.

Cream the butter and sugar and add the golden syrup and the beaten egg. Mix the cocoa with a little hot water, and add. Dissolve the soda in the milk, and add, and then stir in the sifted flour and baking powder. Bake for 20 minutes in a moderate oven.

### CHOCOLATE BUNS.

2 cups flour, 1 cup sugar, 2 tablespoons cocoa, 2 eggs, essence of vanilla, 1 teaspoon baking powder, 4oz. dripping, 1 tablespoon vinegar.

Cream the dripping and add the sugar. Beat the eggs well and add the vinegar. Dissolve the cocoa in a little boiling water, add vanilla essence, and stir this in, sifting in the flour and baking powder last. Place spoonfuls on an oven tray and bake in a fairly hot oven about 12 minutes. When cool decorate with chocolate icing and chopped walnuts, or join together in pairs with chocolate icing.

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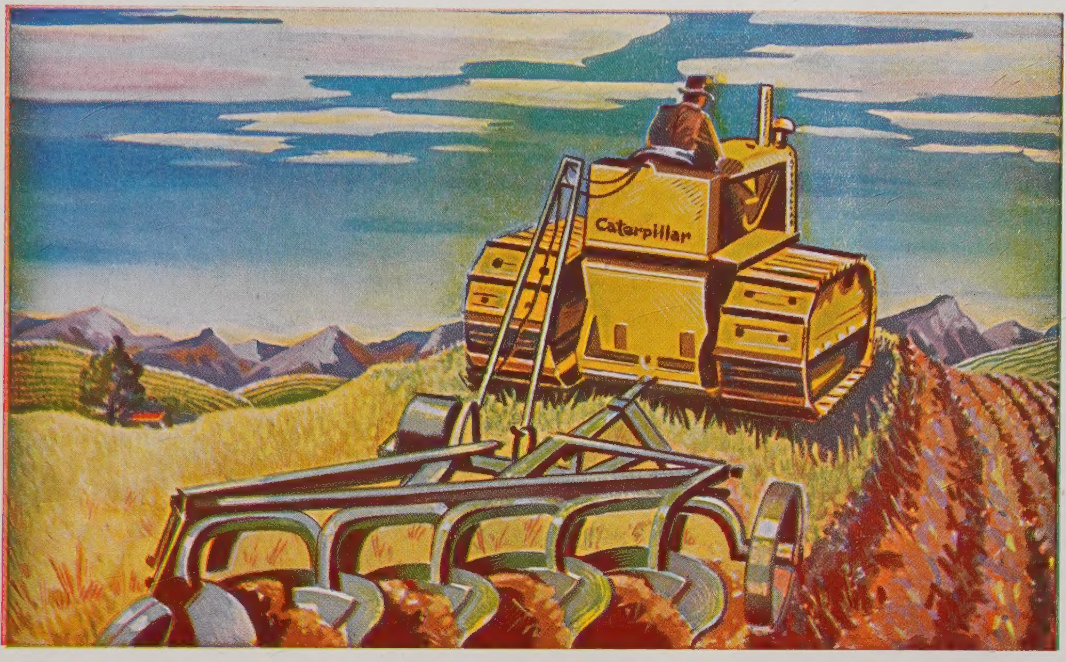

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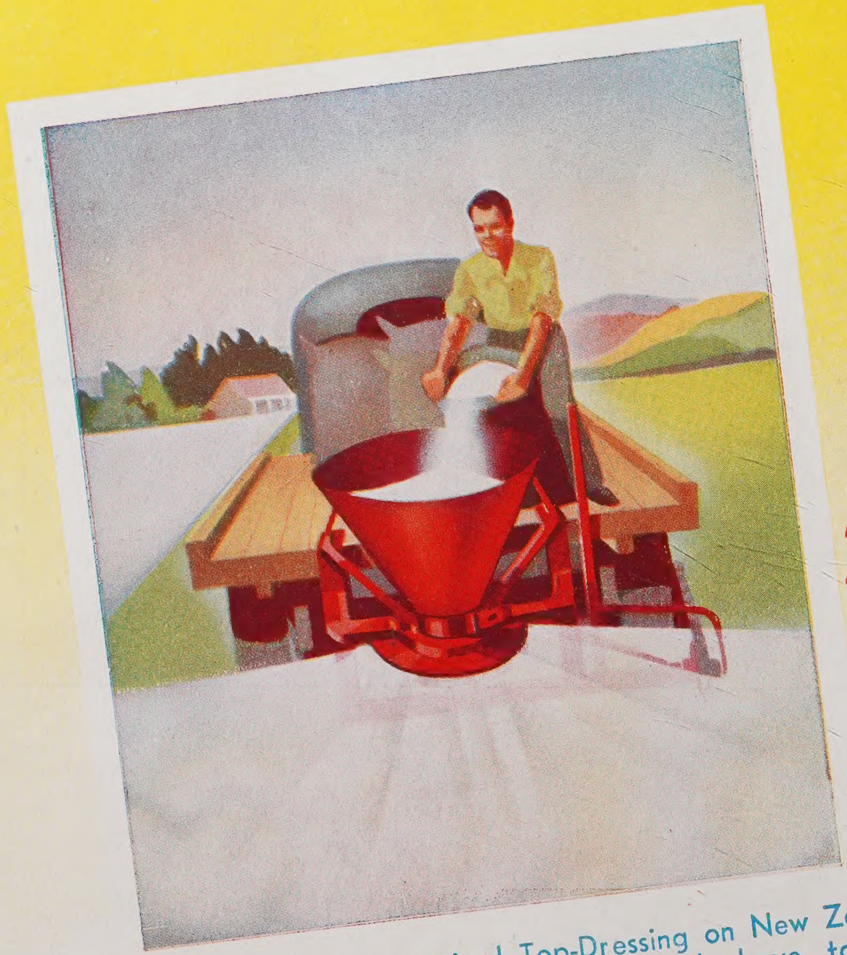

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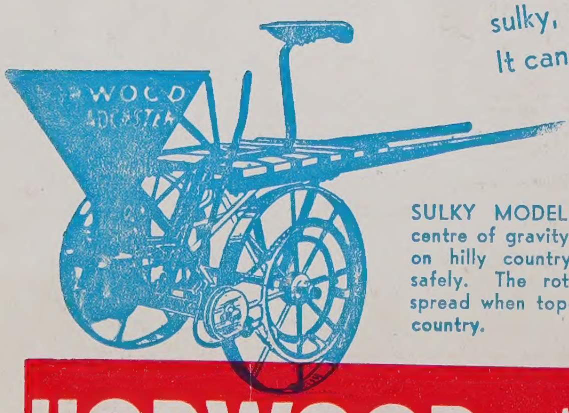

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